



AIR MEASUREMENT SERVICES, INC.

Horizon Test #: W07-042-FRC

Date Tested: April 21, 2005

Report Date: May 26, 2005

Revision Number: 0

**ANNUAL EMISSIONS TEST
OF LANDFILL GAS FLARE #3
BRADLEY LANDFILL**

Permit to Operate Number: F67268

Facility ID Number: 050310

Prepared for:


Waste Management Recycling and
Disposal Services of California, Inc.
9081 Tujunga Avenue, 2nd Floor
Sun Valley, California 91352

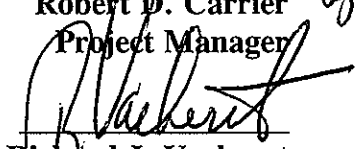
Prepared by:

Horizon Air Measurement Services, Inc.
996 Lawrence Drive, Suite 108
Newbury Park, California 91320

Regulatory Agency:

South Coast Air Quality Management District
21865 East Copley Drive
Diamond Bar, California 91765


Robert D. Carrier
Project Manager


Richard J. Vacherot
Technical Director



HORIZON

AIR MEASUREMENT SERVICES, INC.

May 26, 2005

Mr. John Workman
Waste Management
25772 Springbrook Road
Saugus, California 91350

Dear Mr. Workman:

Please find enclosed three copies of the final report entitled "Annual Emissions Test of Landfill Gas Flare #3 Bradley Landfill."

If you have any questions please call me at (805) 498-8781.

Sincerely,

HORIZON AIR MEASUREMENT SERVICES, INC.



Robert D. Carrier
Project Manager



RC:lmb

cc: Mr. Andrew Washington, The Shaw Group, Inc.



TABLE OF CONTENTS

1. INTRODUCTION	Page 1
2. SUMMARY OF RESULTS	Page 3
3. FLARE DESCRIPTION AND OPERATION	Page 5
3.1 Flare Description	Page 5
3.2 Sample Location	Page 5
3.3 Process Operation During Testing	Page 5
4. SAMPLING/ANALYSES	Page 7
4.1 Sample Location	Page 7
4.1.1 Flare Exhaust	Page 7
4.1.2 Landfill Gas Supply Line	Page 8
4.2 Moisture	Page 8
4.2.1 Inlet - SCAQMD Method 4.1	Page 8
4.2.2 Outlet - SCAQMD Method 5.1	Page 8
4.3 Flow Rate	Page 8
4.3.1 Inlet	Page 9
4.3.2 Outlet - SCAQMD Method 5.1	Page 9
4.4 Particulate Matter (Outlet) - SCAQMD Method 5.1	Page 9
4.5 Oxides of Nitrogen, Carbon Monoxide, Carbon Dioxide, Oxygen (Continuous Emissions Monitoring) - SCAQMD Method 100.1	Page 9
4.6 Hydrogen Sulfide (H ₂ S), and C ₁ - C ₃ Sulfur Compounds (Inlet) - SCAQMD Method 307.91 Equivalent	Page 10
4.7 Speciated Organic Compounds - SCAQMD Rule 1150.1 List	Page 10
4.7.1 Inlet	Page 10
4.7.2 Outlet	Page 10
4.8 Total Non Methane Hydrocarbons, Methane, Carbon Dioxide and Carbon Monoxide	Page 11
4.8.1 Inlet - SCAQMD Method 25.1	Page 11
4.8.2 Outlet - SCAQMD Method 25.3	Page 11
5. RESULTS DISCUSSION	Page 12
APPENDIX A - Sampling and Analytical Methods	
APPENDIX B - Computer Printout of Results	
APPENDIX C - Laboratory Results	
APPENDIX D - Field Data Sheets	
APPENDIX E - Calibration Information	
APPENDIX F - Strip Chart Data	
APPENDIX G - Process Data	
APPENDIX H - Permit to Operate	



1. INTRODUCTION

Under Condition No. 19 of Permit to Operate No. F67268, Waste Management Recycling and Disposal Services of California, Inc. is required to conduct source test on a landfill gas flare (Flare #3) located at Bradley Landfill and Recycling Center. Horizon Air Measurement Services, Inc. (Horizon) had been retained for this purpose.

All testing/analytical procedures conformed to those outlined in Horizon Test Plan No. W07-042-TP, which had been approved by the South Coast Air Quality Management District (SCAQMD). Horizon completed the source testing on April 21, 2005.

Two samples were taken for each parameter of interest (Table 1-1) with the exception of trace organic compounds and reduced sulfur compounds, for which only one sample per location was collected. The results of the testing program, with respect to Permit limits, are provided in Section 2 - Results Summary.

A brief description of the flare and flare operating conditions during testing is provided in Section 3. Section 4 provides a summary of sampling/analytical procedures utilized. Section 5 provides a more detailed results summary/discussion.



Table 1-1
Compounds of Interest
Waste Management - Bradley Landfill
Flare #3
April 21, 2005

PARAMETER	LOCATION	METHOD	NUMBER OF SAMPLES PER SOURCE
Total Non Methane Hydrocarbons	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 25.3	2
Reduced Sulfur Compounds (C ₁ -C ₃) Including H ₂ S	Inlet	SCAQMD Method 307.91 Equivalent	1
Speciated Organic Compounds	Inlet	Whole Air/GC-MS (1150 list)	1
	Outlet	Whole Air/GC-MS (1150 list)	1
Particulate Matter	Outlet	SCAQMD Method 5.1	2
Oxides of Nitrogen	Outlet	SCAQMD Method 100.1	2
Carbon Monoxide	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 100.1	2
Oxygen	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 100.1	2
Carbon Dioxide	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 100.1	2
Methane	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 25.3	2
Flow Rate/Temperature	Inlet	SCAQMD Method 2.3	2
	Outlet	SCAQMD Method 5.1/Calculated	2
Moisture	Outlet	SCAQMD Method 5.1	2
	Inlet	SCAQMD Method 4.1	2
BTU Content	Inlet	SCAQMD Method 25.1	2



2. SUMMARY OF RESULTS

The results of the testing program conducted on April 21, 2005 are provided in Table 2-1. Emission rates of oxides of nitrogen, carbon monoxide, total particulate matter, total non-methane organics and total sulfur compounds (as SO₂) were within Permit limitations. A more detailed discussion of results is provided in Section 5.

Table 2-1
Summary of Results
Waste Management - Bradley Landfill
Flare #3
April 21, 2005

Parameter	Measured Emission Rate*	Permitted Emission Rate*
Oxides of Nitrogen, as NO ₂	1.57 lb/hour 0.049 lb/MMBtu	2.58 lb/hour 0.06 lb/MMBtu
Total Particulate Matter	0.64 lb/hour	1.31 lb/hour
Carbon Monoxide	<1.06 lb/hour	2.37 lb/hour
Total Non Methane Organics, as CH ₄	0.079 lb/hour	0.66 lb/hour
Total Non Methane Organics, as C ₆	0.80 ppm @ 3% O ₂	20 ppm C ₆ @ 3% O ₂ (Rule 1150.1)
Total Sulfur Compounds, as SO ₂	0.55 lb/hour	3.16 lb/hour

- * Measured emission rates shown are the average of two test runs (samples).
 ** From facility flow rate meter.
 *** Determined using SCAQMD Method 2.3.



3. FLARE DESCRIPTION AND OPERATION

3.1 Flare Description

The landfill gas flare consists of an insulated steel cylinder 50 feet high and 96 inches inside diameter (see Figure 3-1). Landfill gas flow rate was continuously monitored and recorded on a strip chart by the facility. Flare operating temperature during the test was set at 1600°F. Flare temperature was continuously monitored by the facility.

Condensate flow rate is limited to five gallons per minute. The source test was conducted at a condensate flow rate of approximately 3.6 gallons per minute.

3.2 Sample Location

Flare exhaust samples were obtained from each two ports positioned at right angles, located five feet from the top of the flare and approximately 45 feet above ground level.

Inlet samples were obtained from the 10-inch diameter (ID) landfill gas line supplying the flare 48 inches (4.8 diameters) downstream and 24 inches (2.4 diameters) upstream of any flow disturbance.

3.3 Process Operation During Testing

The flare was operating under the following conditions during the source test period:

	<u>Run 1</u>	<u>Run 2</u>
Flare Temperature -	1578 °F	1570 °F
Landfill Gas Flow Rate -	1939 scfm	1976 scfm
Condensate Injection Rate -	3.5 gpm	3.7 gpm

A facility strip chart of these process parameters is provided in Appendix G, Process Data.



TOTAL DIAMETER = 96" ID.
TOTAL HEIGHT = 50'

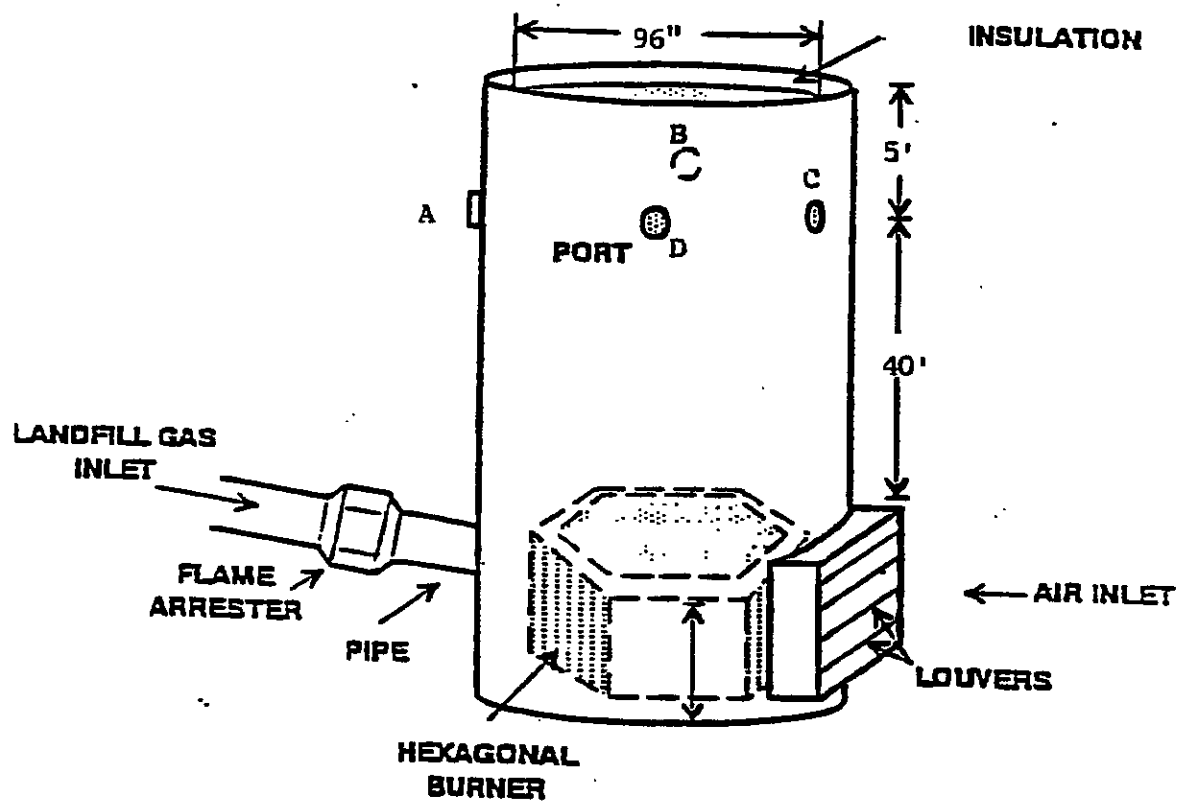


Figure 3-1

Page 1 of 1

Page 2 of 2

Page 3 of 3

Page 4 of 4

Page 5 of 5

Page 6 of 6

Page 7 of 7

Page 8 of 8

Page 9 of 9

Page 10 of 10

Page 11 of 11

Page 12 of 12

Page 13 of 13

Page 14 of 14

Page 15 of 15

Page 16 of 16

Page 17 of 17

Page 18 of 18

Page 19 of 19

4. SAMPLING/ANALYSES

The sampling/analytical program had been designed to quantify the parameters of interest outlined in Table 1-1.

4.1 Sample Location

4.1.1 Flare Exhaust

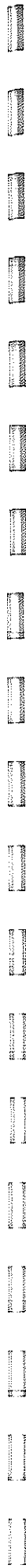
At the flare exhaust 24 sample points (12 per diameter), determined in accordance with Method 1, were utilized for the determination of the following compounds:

- Particulate matter
- NO_x
- CO
- O₂/CO₂
- Flow Rate
- Moisture

The exact locations of the sampling points are provided in Appendix D, Field Data Sheets. A description of SCAQMD Method 1 is provided in Appendix A.

One sample points at the center of the stack was utilized for the collection of the following compounds:

- speciated organic compounds
- total non methane hydrocarbons
- methane



4.1.2 Landfill Gas Supply Line

Eight sample points, chosen in accordance with SCAQMD Method 1.1, were used to gather velocity data.

A single sample point was utilized for the collection of the following compounds:

- total non methane hydrocarbons
- methane
- CO
- CO₂/O₂
- reduced sulfur compounds
- speciated organic compounds
- BTU content
- Moisture

4.2 Moisture

4.2.1 Inlet - SCAQMD Method 4.1

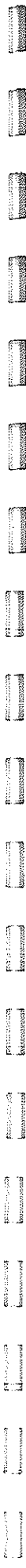
Landfill gas moisture content was determined using SCAQMD Method 4.1. Two, one-hour test runs were conducted in conjunction with the outlet particulate and SCAQMD Method 100.1 testing. A description of SCAQMD Method 4.1 is provided in Appendix A.

4.2.2 Outlet - SCAQMD Method 5.1

Moisture content of the flare exhaust was determined using SCAQMD Method 4.1 in conjunction with SCAQMD Method 5.1, as detailed in Appendix A.

4.3 Flow Rate

A copy of the source-dedicated on-line flow chart can be found in Appendix G. This chart identifies: landfill gas flow to flare, condensate flow rate to flare and flare stack temperature readings.



4.3.1 Inlet

Landfill gas flow rate was determined in accordance with SCAQMD Method 2.3. A description of SCAQMD Method 2.3 is provided in Appendix A.

4.3.2 Outlet - SCAQMD Method 5.1

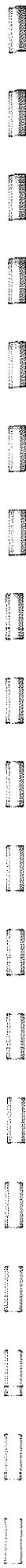
The landfill flare flow rate was monitored in conjunction with SCAQMD Method 5.1, as detailed in Appendix A. However, since the flare exhaust velocity was below the applicable limit (0.05 in. WG ΔP) of SCAQMD Method 2.1/5.1, the exhaust flow rate was calculated stoichiometrically based upon the landfill gas composition and stack dilution.

4.4 Particulate Matter (Outlet) - SCAQMD Method 5.1

Horizon conducted two, 60-minute test runs on the flare exhaust for particulate matter determination in accordance with SCAQMD Method 5.1 protocol. Twenty-four traverse points were utilized for the collection of particulate matter at the flare exhaust. A description of SCAQMD Method 5.1 is provided in Appendix A. Stack gases were withdrawn through an integral quartz nozzle and probe.

4.5 Oxides of Nitrogen, Carbon Monoxide, Carbon Dioxide, Oxygen (Continuous Emissions Monitoring) - SCAQMD Method 100.1

Two, 60-minute test runs were conducted at the flare exhaust. Twenty-four sample points were utilized. All sampling was performed under the guidelines of SCAQMD Method 100.1 as detailed in Appendix A.



4.6 Hydrogen Sulfide (H₂S), and C₁ - C₃ Sulfur Compounds (Inlet) - SCAQMD Method 307.91 Equivalent

Hydrogen sulfide and C₁ - C₃ sulfur compound samples were collected at the inlet of the flare using the Tedlar bag collection system depicted in SCAQMD Method 25.2 (Appendix A). All system components coming in contact with the landfill gas were Teflon.

Hydrogen sulfide and C₁ - C₃ sulfur compounds were analyzed using a Method 307.91 equivalent by AtmAA, Inc. Equivalency had been formally granted by SCAQMD to AtmAA, Inc. for this Method.

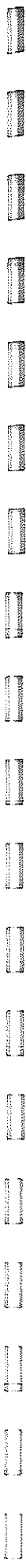
4.7 Speciated Organic Compounds - SCAQMD Rule 1150.1 List

4.7.1 Inlet

Speciated organic compounds were collected at the flare inlet of the landfill gas using the Tedlar bag collection system depicted in SCAQMD Method 25.2 (Appendix A). All system components coming in contact with the landfill gas were Teflon or stainless steel. Speciated organic compounds (SCAQMD Rule 1150.1 list) were identified and quantified using GC/MS analytical procedures.

4.7.2 Outlet

Speciated organic compound samples were collected in conjunction with the particulate/CEM testing at the exhaust using the Tedlar bag sampling system depicted in Appendix A. Each sample was then analyzed for speciated organic compounds (SCAQMD Rule 1150.1 list) using GC/MS procedures.



4.8 Total Non Methane Hydrocarbons, Methane, Carbon Dioxide and Carbon Monoxide

4.8.1 Inlet - SCAQMD Method 25.1

Total non methane hydrocarbons, methane, CO₂ and CO concentration were determined at the flare inlet from duplicate samples using SCAQMD Method 25.1. A description of SCAQMD Method 25.1 is provided in Appendix A.

4.8.2 Outlet - SCAQMD Method 25.3

Duplicate samples were obtained for total non methane hydrocarbon and methane concentration determination. Total non methane hydrocarbons and methane were determined using SCAQMD Method 25.3. A description of SCAQMD Method 25.3 is provided in Appendix A.



5. RESULTS DISCUSSION

Detailed results of the testing conducted on Flare #3 on April 21, 2004 are presented in Table 5-1 and 5-2. Since the flare exhaust velocity was below the applicable range ($>0.05 \Delta P$ inches water gauge) of SCAQMD Method 2.1, the flare exhaust flow rate for each test run was calculated stoichiometrically based upon the composition of the landfill gas and the exhaust stack dilution. Oxide of sulfur emission rate was calculated based upon the landfill gas total sulfur compound concentration and flow rate (see Appendix B).

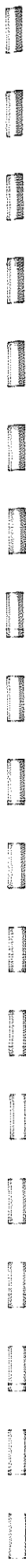


Table 5-1
Summary of Results
Waste Management - Bradley Landfill
Flare #3
April 21, 2005

	LANDFILL GAS			FLARE EXHAUST		
Run Number	1	2	Avg.	1	2	Avg.
STACK GAS CHARACTERISTICS						
Temperature, degrees F	118	129	124	1646	1621	1633
Moisture, %	5.9	6.2	6.1	13.0	13.3	13.2
Flow Rate, acfm	1803	1947	1875			
Flow Rate, dscfm	1521	1606	1563	11579	* 12274	* 11926
Fixed Gases						
Oxygen, %	4.20	-	4.20	11.11	11.15	11.13
Carbon Dioxide, %	28.90	-	28.90	8.56	8.89	8.73
Methane, %	33.95	-	33.95	0.00	0.00	0.00
BTU Value, Btu/scf	343	-	343	-	-	-
EMISSIONS						
Oxides of Nitrogen						
ppm	-	-	-	18.4	17.9	18.1
ppm @ 3 % O2	-	-	-	33.6	32.9	33.2
lb/hr	-	-	-	1.546	1.599	1.572
lb/MMBtu	-	-	-	0.049	0.048	0.049
Carbon Monoxide						
ppm	-	-	-	< 20	< 20	< 20
ppm @ 3 % O2	-	-	-	< 37	< 37	< 37
lb/hr	-	-	-	< 1.03	< 1.09	< 1.06
lb/MMBtu	-	-	-	< 0.033	< 0.033	< 0.033
Total Particulate Matter						
gr/dscf	-	-	-	0.0035	0.0088	0.0062
lb/hr	-	-	-	0.35	0.93	0.64
Total Non-Methane Hydrocarbons (Reactive Organic Compounds)						
ppm, as Methane	2058	-	2058	2.63	-	2.63
lb/hr, as Methane	8.13	-	8.13	0.079	-	0.079
Sulfur Compounds						
Hydrogen Sulfide, ppm	23.3	-	23.3	0.50	-	0.50
Total Sulfur, ppm as H2S	34.8	-	34.8	-	-	-
Oxides of Sulfur**						
lb/hr	-	-	-	0.55	-	0.55

* Flow Rate calculated stoichiometrically

** Calculated from sulfur balance



Table 5-2
Trace Organic Species
Destruction Efficiency Results
Waste Management - Bradley Landfill
Flare #3
April 21, 2005

Species	Inlet			Outlet			Destruction Efficiency (%)
	Concentration (ppb)	Emission Rate (lb/hr)		Concentration (ppb)	Emission Rate (lb/hr)		
Hydrogen Sulfide	23300	1.96E-01		< 500	< 3.21E-02	>	83.63
Benzene	7240	1.40E-01		< 2.3	< 3.32E-04	>	99.76
Benzylchloride	< 40	< 1.26E-03		< 0.8	< 1.92E-04		NA
Chlorobenzene	321	8.96E-03		< 0.3	< 6.39E-05	>	99.29
Dichlorobenzenes	1380	5.01E-02		< 1.1	< 3.05E-04	>	99.39
1,1-dichloroethane	140	3.43E-03		< 0.3	< 5.60E-05	>	98.37
1,2-dichloroethane	50.4	1.23E-03		< 0.3	< 5.60E-05	>	95.46
1,1-dichloroethylene	44.6	1.07E-03		< 0.3	< 5.49E-05	>	94.87
Dichloromethane	250	5.25E-03		1.28	2.05E-04		96.09
1,2-dibromoethane	< 30	< 1.39E-03		< 0.3	< 1.06E-04		NA
Perchloroethene	1120	6.56E-02		< 0.2	< 8.94E-05	>	99.86
Carbon tetrachloride	< 30	< 1.14E-03		< 0.2	< 5.81E-05		NA
Toluene	22000	5.00E-01		0.37	6.42E-05		99.99
1,1,1-trichloroethane	< 30	< 9.86E-04		< 0.2	< 5.02E-05		NA
Trichloroethene	418	1.35E-02		< 0.2	< 4.94E-05	>	99.63
Chloroform	< 30	< 8.82E-04		< 0.2	< 4.49E-05		NA
Vinyl Chloride	392	5.90E-03		< 0.3	< 3.54E-05	>	99.40
m xylenes	12400	3.25E-01		0.36	7.19E-05		99.98
o+p xylene	4500	1.18E-01		< 0.3	< 6.00E-05	>	99.95
TNMHC	2057907	8.14E+00		2626	7.33E-02		99.10

Note: All values preceded by "<" are below the detection limit - reported values are detection limit values.
NA--Not applicable: Destruction efficiency cannot be calculated since both inlet and outlet values are below the detection limit.



APPENDIX A - Sampling and Analytical Methods

Method: Stack Gas Velocity and Volumetric Flow Rate From Small Stacks or Ducts

Applicable for Methods: SCAQMD Method 2.3

Principle: The average gas velocity in a stack gas is determined from the gas density and from measurement of the average velocity head with a standard pitot tube.

Sampling Procedure: The velocity head and temperature is measured at the traverse points specified by SCAQMD Method 1.2. The static pressure in the stack and the atmospheric pressure is determined. The stack gas molecular weight is determined from independent measurements of O₂, CO₂ and H₂O concentrations.

Sample Recovery: and Analyses: The stack gas velocity is determined from the measured average velocity head, the measured dry concentrations of O₂ and CO₂ and the measured concentration of H₂O. The velocity is determined from the following set of equations:

Where,

ΔP = velocity head, inches in H₂O
 Ts = gas/temperature, degrees R
 Ps = absolute static pressure

Mwd = dry molecular weight
 Mw = molecular weight
 Cp = pitot flow coefficient

Dry molecular weight of stack gas

$$Mwd = 0.44 (\%CO_2) + 0.32 (\%O_2) + 0.28 (\%N_2 + \%CO)$$

Molecular weight of stack gas, wet basis

$$M_w = (M_{wd} \times M_d) + 18 (1 - M_d)$$

$$\text{Where, } M_d = \frac{100 - Bws}{100}$$

Stack gas velocity

$$(V_s)_{avg.} = (5130) C_p \times \sqrt{\Delta P_{avg.}} \times \sqrt{T_s} \times \left(\frac{1}{P_s \times M_w} \right)^{1/2}$$

Method:**Determination of Moisture in Stack Gases****Applicable for
Methods:**

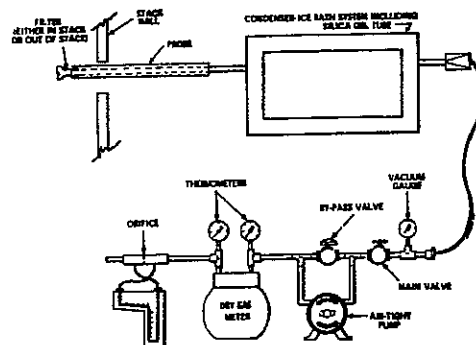
EPA Method 4, ARB 1-4, SCAQMD Method 4.1

Principle:

A gas sample is extracted at a constant rate from the source; moisture is removed from the stream and determined either volumetrically or gravimetrically.

Sampling Procedure:

Set up train as shown in the following figure. Sample is drawn at a constant rate through a sufficiently heated probe. The probe is connected to the impinger train by Teflon or glass tubing. The train consists of two greenburg smith impinger (SCAQMD 4.1) or one modified and 1 greenburg smith impinger (CARB & EPA) each containing 100 ml of water, an empty impinger as a knock-out and an impinger containing silica gel to protect the pump from moisture.

**Sample Recovery:
and Analyses:**

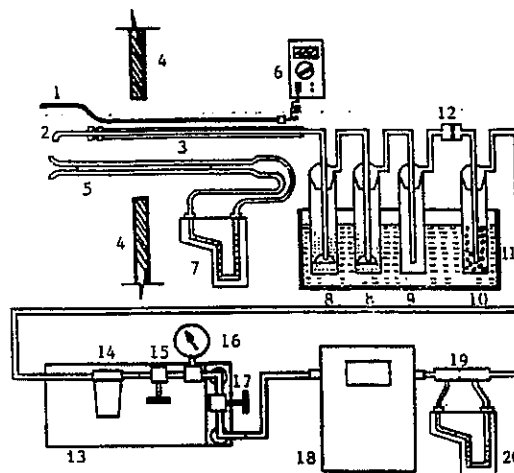
Following testing, moisture content is determined gravimetrically or volumetrically from initial and final impinger contents weights or volume.

Method: **Determination of Particulate Matter Emissions From Stationary Sources Using a Wet Impingement Train**

Reference: SCAQMD Method 5.1

Principle: Stack gas is withdrawn isokinetically from the source through a sample train. Particulate matter is collected in impingers containing deionized water and on a back-up filter. The impingers are contained in an ice bath to maintain a sampled gas temperature of approximately 15° C (60° F). The filter is not heated.

Sampling Procedure: The sampling train is shown in the figure below. The sample is drawn isokinetically through a glass or quartz probe (hi-temp). The probe is connected to an impinger train by Teflon tubing. The train consists of two Greenburg-Smith impingers which contain 100 ml of DI water; an empty impinger as a knock-out; and an impinger containing silica gel to protect the pump from moisture. Sample is withdrawn isokinetically from each predetermined sample point (determined using SCAQMD Method 1.1) through the sample train, which is followed by a vacuum line, a pump, a dry gas meter and a calibrated orifice.



- | | |
|--|---|
| 1. Temperature Sensor | 11. Ice Bath |
| 2. Nozzle | 12. Filter |
| 3. Glass Lined Stainless Steel Probe | 13. Sealed Pump (Leak Free) |
| 4. S-type Pitot Tube | 14. Filter for Pump |
| 5. Stack Wall | 15. Metering Valve |
| 6. Temperature Sensor Meter | 16. Vacuum Gauge |
| 7. Pitot Tube Inclined Manometer | 17. By-pass Valve |
| 8. Impinger with 100 ml H ₂ O | 18. Temperature Compensated Dry Gas Meter |
| 9. Empty Bubbler | 19. Orifice |
| 10. Bubbler with Silica Gel | |

Sample Recovery: The moisture content is determined either gravimetrically or volumetrically from initial and final impinger weights or volume. Then the filter, probe/impinger rinse (including nozzle rinse, liner rinse, impinger contents and rinses) and silica gel are recovered into Containers #1, #2 and #3, respectively.

Analytical Procedure: The aqueous sample is filtered through a tared fiberglass filter. An organic extraction is performed on the resulting solution using methylene chloride. Both the extraction filter and sample train filter are desiccated then measured gravimetrically. The organic extract and aqueous catch are evaporated, desiccated and measured gravimetrically.

If significant levels of sulfur compounds are present in the stack, each sample fraction is analyzed by acid-base titration for acid sulfate content and by barium-thorin titration for sulfate content.

Method: Carbon Monoxide by SCAQMD Micro Total Carbon Analyses

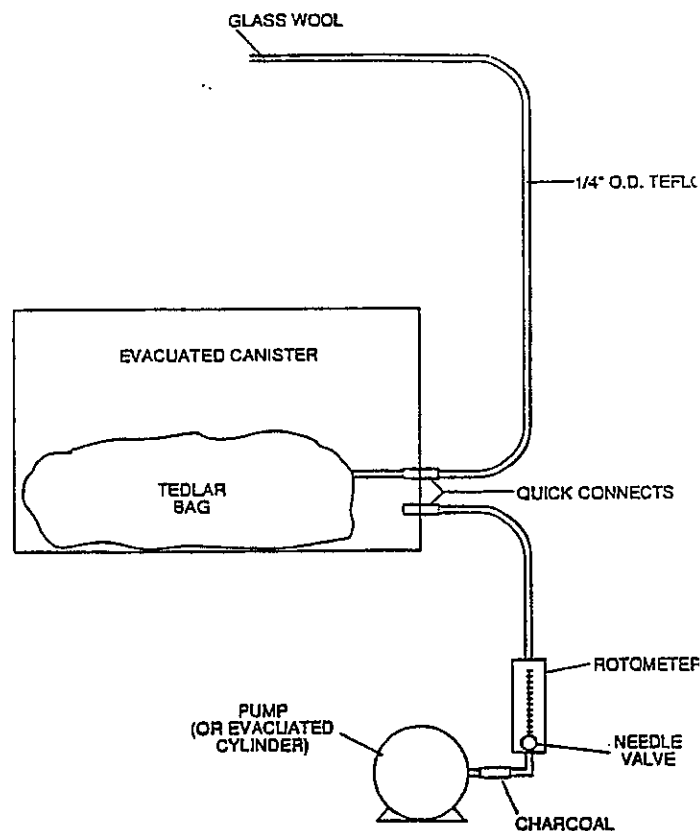
Reference: SCAQMD Method 10.1 (Tedlar Bag)

Principle: A Tedlar bag is filled with flue gas at a constant rate. The bag contents are analyzed by total combustion analyses/flame ionization detection for carbon monoxide.

Sampling Procedure: A gas sample is collected by evacuating the canister, see figure, at a constant rate over each test run using a rotameter/needle valve and a diaphragm pump. This causes the Tedlar bag to fill with stack gas at a constant rate while maintaining sample integrity.

Prior to each sampling run, the evacuated canister (containing the Tedlar bag) is leak checked at 2" Hg vacuum. The sample train upstream of the Tedlar bag is then purged with stack gas. At the conclusion of each test run, each Tedlar bag sample is sealed and stored in an opaque container pending analysis.

Analytical Procedure: Carbon monoxide concentration from the sample is determined using the SCAQMD Total Combustion Analysis (TCA) procedure.



Method:	Determination of Total Gaseous Non-Methane Organic Emissions as Carbon
Reference:	SCAQMD Method 25.1
Principle:	A sample of flue gas is drawn through a condensate trap and into an evacuated 12 liter tank. Volatile organic compounds (VOC), as total gaseous non-methane organics (TGNMO), are determined by combining results from independent analysis of condensate in the traps and gases in the tanks.
Sampling Procedure:	<p>Duplicate gas samples are withdrawn from a source at a constant rate through condensate traps immersed in dry ice followed by evacuated 12 liter (nominal) tanks. Heavy organic components condense as liquids and solids in the condensate traps. Lighter components pass as gases through the traps into the tanks. The combined results from tanks and trap analyses are used to determine a qualitative and quantitative expression of the effluent gas stream. Duplicate sampling is designed into the system to demonstrate precision.</p> <p>The sampling apparatus is checked for leaks prior to the sampling program by attaching the probe end to an absolute pressure gauge and vacuum pump in series. The sample lines were evacuated to less than 10 mm Hg and the gauge shutoff valve is then closed. The sample lines are deemed to be leak-free if no loss of vacuum occurs as indicated by the vacuum gauge. During sampling the tank pressures are monitored with a 0-30 inch vacuum gauge to ensure integrated sampling.</p> <p>The final vacuum of each sample is measured using a slack tube manometer. The sample is then pressurized to 800 mm Hg absolute with ultrapure nitrogen. Each sample is then analyzed using the SCAQMD TCA procedure for total non methane hydrocarbons.</p>
Analytical Procedure:	<p>Condensate traps are analyzed by first stripping carbon dioxide (CO₂) from the trap. The organic contents are then removed and oxidized to CO₂. This CO₂ is quantitatively collected in an evacuated vessel and measured by injection into a flame ionization detection/total combustion analysis (FID/TCA) system.</p> <p>The organic content of the sample fraction collected in each tank is measured by injecting a portion into the FID/TCA analysis system which uses a two phase gas chromatography (GC) column to separate carbon monoxide (CO), methane (CH₄) and carbon dioxide (CO₂) from each other and from the total gaseous non-methane organics (TGNMO) which are eluted as backflush. All eluted components are first oxidized to CO₂ by a hopcalite catalyst and then reduced to methane by a nickel catalyst. The resulting methane is detected using the flame ionization detector. A gas standard containing CO, CH₄, CO₂ and propane, traceable to NBS, is used to calibrated the FID/TCA analysis system.</p>

Method:

Determination of Total Gaseous Non-Methane Organic Emissions as Carbon

Reference:

SCAQMD Method 25.3

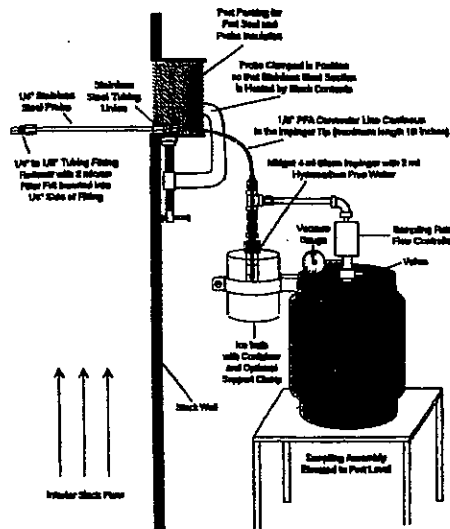
Principle:

A sample of flue gas is drawn through a condensate trap (mini-impinger) and into an evacuated six liter SUMMA canister. Volatile organic compounds (VOC), as total gaseous non-methane organics (TGNMO), are determined by combining results from independent analysis of condensate in the traps and gases in the SUMMA canisters.

Sampling Procedure:

Duplicate gas samples are withdrawn from a source at a constant rate through condensate traps immersed in an ice bath followed by evacuated six liter (nominal) SUMMA canisters. Heavy organic components condense as liquids and solids in the condensate traps. Lighter components pass as gases through the traps into the canisters. The combined results from canisters and mini-impinger analyses are used to determine a qualitative and quantitative expression of the effluent gas stream. Duplicate sampling is designed into the system to demonstrate precision.

The sampling apparatus is checked for leaks prior to the sampling program by capping the end of the sample probe. The sample flow valve is then opened and then closed to introduce vacuum to the system. The vacuum drop should then cease numerically above 10 in. Hg. A cease in movement of the vacuum gauge for a period of ten minutes indicates an acceptable leak check. When sampling is initiated, the vacuum gauge must indicate a canister vacuum of greater than 28 in. Hg. Immediately after sampling a post-test leak check is performed, followed by a rinse of the PFA line into the condensate trap with 0.5 to 1.0 ml of hydrocarbon free water.



Analytical Procedure:

Condensate traps are analyzed for total organic carbon by liquid injection into an infrared total organic carbon analyzer.

The organic content of the sample fraction collected in each canister is measured by injecting a portion into the FID/TCA analysis system which uses a two phase gas chromatography (GC) column to separate carbon monoxide (CO), methane (CH₄) and carbon dioxide (CO₂) from each other and from the total gaseous non-methane organics (TGNMO) which are eluted as backflush. All eluted components are first oxidized to CO₂ by a hopcalite catalyst and then reduced to methane by a nickel catalyst. The resulting methane is detected using the flame ionization detector. A gas standard containing CO, CH₄, CO₂ and propane, traceable to NBS, is used to calibrate the FID/TCA analysis system.

CONTINUOUS EMISSIONS MONITORING SYSTEM - TRUCK

SCAQMD Method 100.1

The continuous emissions monitoring system consists of a Thermo Electron Model 10AR chemiluminescence NO/NO_x analyzer, a Teledyne electro chemical O₂ analyzer, a Thermo Electron Model 48H CO gas filter correlation analyzer and a Horiba PIR 2000 non dispersive infrared CO₂ analyzer. All analyzer specifications are provided in Table 1. All concentrations are determined on a dry basis. Concentrations of NO_x, CO, O₂ and CO₂ are continuously recorded on a Linseis 10-inch strip chart recorder and a Strawberry Tree Data Acquisition System (DAS). The extractive monitoring system conforms with the requirements of SCAQMD Method 100.1.

The sampling probe (heated to 250°F), constructed of 1/2 inch-diameter 316 stainless steel, is connected to a condenser with a six foot length of 3/8 inch Teflon line (heated to 250°F). A Nupro stainless steel filter (10 micron) is connected at the tip of the probe and maintained at stack temperature.

The condenser consists of a series of two stainless steel moisture knock-out bottles immersed in an ice water bath. The system is designed to minimize contact between the sample and the condensate. Condensate is continuously removed from the knock-out bottles via a peristaltic pump. The condenser outlet temperature is monitored either manually at 10-minute intervals or on a strip chart recorder/DAS system. The sample exiting the condenser is then transported through a filter, housed in a stainless steel holder, followed by 3/8 inch O.D. Teflon tubing and a Teflon coated (or stainless steel/viton) diaphragm pump to the sample manifold. The sample manifold is constructed of stainless steel tubing and directs the sample through each of five rotameters to the NO_x monitor, O₂ monitor, CO monitor, CO₂ monitor and excess sample exhaust line, respectively. Sample flow through each channel is controlled by a back pressure regulator and by stainless steel needle valves on each rotameter. All components of the sampling system that contact the sample are composed of stainless steel, Teflon or glass.

The calibration system is comprised of two parts: the analyzer calibration and the system bias check. The calibration gases are, at a minimum, certified to $\pm 1\%$ by the manufacturer. Where necessary to comply with the reference method requirements, EPA Protocol 1 gases are used. The cylinders are equipped with pressure regulators which supply the calibration gas to the analyzers at the same pressure and flow rate as the sample. The selection of zero, span or sample gas directed to each analyzer is accomplished by operation of the zero, calibration or sample selector knobs located on the main flow control panel.

For SCAQMD Method 100.1 testing, the following procedures are conducted before and after each series of test runs:

Leak Check:

The leak check is performed by plugging the end of the sampling probe, evacuating the system to at least 20 inches of Hg. The leak check is deemed satisfactory if the system holds 20 inches of Hg vacuum for five minutes with less than one inch Hg loss.

Linearity Check:

The NO_x, CO, CO₂ and O₂ analyzers linearity check is performed by introducing, at a minimum, zero gas, mid range calibration gas (40-60% scale) and high range calibration gas (80-100% scale). Instrument span value is set on each instrument with the mid range gas. The high range calibration gas (80-100% scale) is then introduced into each instrument without any calibration adjustments. Linearity is confirmed, if all values agree with the calibration gas value to within 2% of the range.

Stratification Check:

A stack stratification check is performed (pre-test only) by traversing the stack with the appropriate number of traverse alternately with the reference point (center). If the gas composition is homogenous, < 10% variation between any traverse points in the gas stream and the normalized average point, single point gas sampling is performed at the reference point. If stratification exceeds the 10% criteria, then the stack cross section is traversed during sampling.

System Bias Check:

The system bias check is accomplished by transporting the same gases used to zero and span the analyzers to the sample system as close as practical to the probe inlet. This is accomplished by opening a valve located on the probe, allowing the gas to flow to the probe and back through the moisture knockout and sample line to the analyzers. During this check the system is operated at the normal sampling rate with no adjustments. The system bias check is considered valid if the difference between the gas concentration exhibited by the measurement system which a known concentration gas is introduced at the sampling probe tip and when the sample gas is introduced directly to the analyzer, does not exceed $\pm 5\%$ of the analyzer range.

Response Time:

Response time (upscale and downscale) for each analyzer is recorded during the system bias check. Upscale response time is defined as the time it takes the subject analyzer gas to reach 95% of the calibration gas value after introducing the upscale gas to the sample bias calibration system. Downscale response time is defined as the time it takes the subject analyzer to return to zero after the zero gas is introduced into the sample system bias calibration system.

NO_x Conversion Efficiency

The NO_x analyzer NO₂ conversion efficiency is determined by injecting a NO₂ gas standard directly into the NO_x analyzer (after initial calibration). The analyzer response must be at least 90% of the NO₂ standard gas value.

NO₂ Converter Efficiency (alternate method)

The mid level NO gas standard is directly injected into a clean leak-free Tedlar bag. The bag is then diluted 1:1 with air (20.9% O₂). The bag is immediately attached to the NO_x sample line. The initial NO_x concentration is recorded on the strip chart. After at least 30 minutes the Tedlar bag is reattached to the NO_x sample line. Analyzer response must be at 98% of the initial Tedlar bag NO_x value to be acceptable.

In between each sampling run the following procedures are conducted:

Zero and Calibration Drift Check:

Upon the completion of each test run, the zero and calibration drift check is performed by introducing zero and mid range calibration gases to the instruments, with no adjustments (with the exception of flow to instruments) after each test run. The analyzer response must be within $\pm 3\%$ of the actual calibration gas value.

Analyzer Calibration:

Upon completion of the drift test, the analyzer calibration is performed by introducing the zero and mid range gases to each analyzer prior to the upcoming test run and adjusting the instrument calibration as necessary.

System Bias Check

(same as above)

A schematic of the sample system and specific information of the analytical equipment is provided in the following pages.

TABLE 1

CONTINUOUS EMISSIONS MONITORING LABORATORY - TRUCK

NO_x CHEMILUMINESCENT ANALYZER -- THERMO ELECTRON MODEL 10 A

Response Time (0-90%)	1.5 sec -- NO mode/1.7 sec -- NO _x mode
Zero Drift	Negligible after 1/2 hour warmup
Linearity	$\pm 1\%$ of full scale
Accuracy	Derived from the NO or NO ₂ calibration gas, $\pm 1\%$ of full scale
Operating Ranges (ppm)	2.5, 10, 25, 100, 250, 1000, 2500, 10000
Output	0-1 volt

O₂ ANALYZER, FUEL TYPE -- TELEDYNE MODEL 326RA

Response Time (0-90%)	60 seconds
Accuracy	$\pm 1\%$ of scale at constant temperature $\pm 1\%$ of scale of $\pm 5\%$ of reading, whichever is greater, over the operation temperature range.
Operating Ranges (%)	0-5, 0-25
Output	0-1 volt

O₂ ANALYZER, PARAMAGNETIC -- SERVOMEX MODEL 1400B

Response Time (0-90%)	15 seconds
Accuracy	0.1% oxygen
Linearity	$\pm 1\%$ scale
Operating Ranges (%)	0-25, 0-100
Output	0-1 volt

CO GAS FILTER CORRELATION -- THERMO ELECTRON MODEL 48H

Response Time (0-95%)	1 minute
Zero Drift	± 0.2 ppm CO
Span Drift	Less than 1% full scale in 24 hours
Linearity	$\pm 1\%$ full scale, all ranges
Accuracy	± 0.1 ppm CO
Operating Ranges (ppm)	50, 100, 250, 500, 1000, 2500, 5000, 10,000, 25,000, 50,000
Output	0-1 volt

TABLE 1 (Cont.)

CO₂ INFRARED GAS ANALYZER -- HORIBA - MODEL PIR 2000

Response Time (0-90%)	5 seconds
Zero Drift	$\pm 1\%$ of full scale in 24 hours
Span Drift	$\pm 1\%$ of full scale in 24 hours
Linearity	$\pm 2\%$ of full scale
Resolution	Less than 1% of full scale
Operating Ranges (%)	0-5, 0-15, 0-25
Output	0-1 volt

SO₂ PULSED FLOURESCENT - TECO - MODEL 43C-HL

Response Time	80 seconds
Zero Drift	$\pm 1\%$
Span Drift	$\pm 1\%$
Linearity	$\pm 1\%$
Resolution	$\pm 1\%$
Operating Ranges	5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000
Output	0-10 volt

RATFISCH FID TOTAL HYDROCARBON ANALYZER -- MODEL 55CA

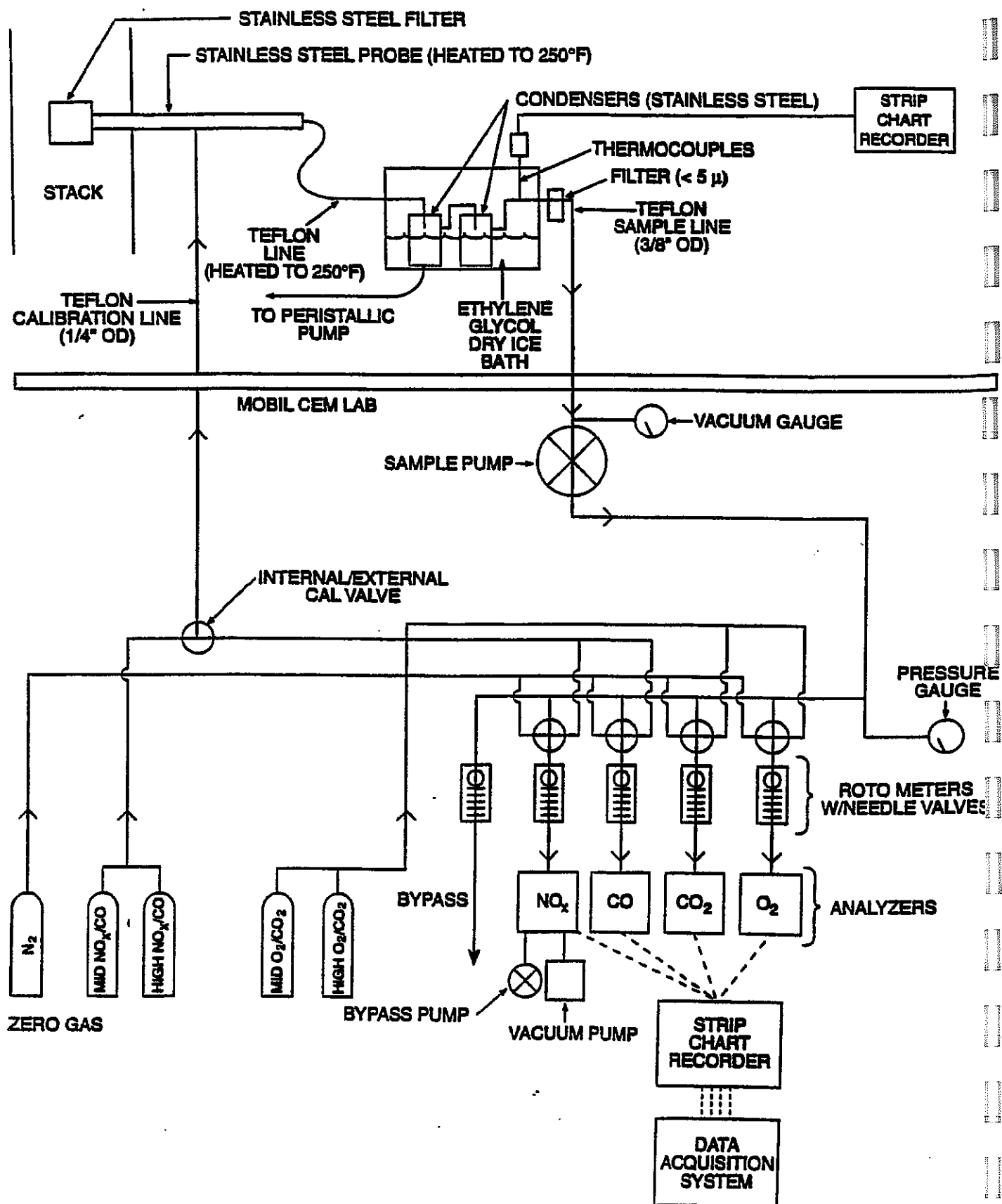
Response Time (0-90%)	5 seconds
Zero Drift	$\pm 1\%$ full scale in 24 hours
Span Drift	$\pm 1\%$ full scale in 24 hours
Linearity	$\pm 1\%$ full scale - constant
Accuracy	$\pm 1\%$ full scale at constant temp.
Operating Ranges (ppm)	10, 100, 1000, 10,000
Output	0 - 10 volts

LINSEIS MODEL L2045 FOUR PEN STRIP CHART RECORDER

Pen Speed	up to 120 cm/min
Measuring Response	0-20 volts
Linearity Error	0.25%
Accuracy	0.3%
Zero Suppression	Manual (from 1 to 10X full scale)

LINEAR 3 PEN CONTINUOUS -- MODEL 595 STRIP CHART

Pen Response	20 inches/second
Measuring Response	1 Mv through 5V
Zero Set	Electronically adjustable full scale with 1 full scale of zero suppression
Accuracy	Total limit of error $\pm 0.5\%$



Method:	NO/NO_x by Continuous Analyzer
Applicable Reference Methods:	EPA 7E, EPA 20; CARB 100, BAAQMD ST-13A, SCAQMD 100.1
Principle:	A sample is continuously withdrawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of NO or NO _x .
Analyzer:	TECO Model 10AR
Measurement Principle:	Chemiluminescence
Accuracy:	1 % of full scale
Ranges:	0-2.5, 0-10, 0-25, 0-100, 0-250, 0-1000, 0-2500, 0-10,000 ppm
Output:	0-10 V
Inferences:	Compounds containing nitrogen (other than ammonia) may cause interference.
Response Time:	90%, 1.5 seconds (NO mode) and 1.7 seconds (NO _x mode)
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. If EPA Method 20 is used, that method's specific procedures for selecting sample points are used.
Analytical Procedure:	<p>The oxides of nitrogen monitoring instrument is a chemiluminescent nitric oxide analyzer. the operational basis of the instrument is the chemiluminescent reaction of NO and ozone (O₃) to form NO₂ in an excited state. Light emission results chemiluminescence is monitored through an optical filter by a high sensitivity photomultiplier tube, the output of which is electronically processed so it is linearly proportional to the NO concentration. The output of the instrument is in ppmV.</p> <p>When NO₂ is expected to be present in the flue gas, a supercooled water dropout flask will be placed in the sample line to avoid loss of NO₂. Since NO₂ is highly soluble in water, "freezing out" the water will allow the NO₂ to reach the analyzers for analysis. The analyzer measures NO only. In the NO_x mode, the gas is passed through a moly converter which converts NO₂ to NO and a total NO_x measurement is obtained. NO₂ is determined as the difference between NO and NO_x. Use of a moly converter instead of a stainless steel converter eliminates NH₃ interference; NH₃ is converted to NO with a stainless converter, but not with a moly converter.</p>

Method:	Oxygen (O₂) by Continuous Analyzer
Applicable Reference Methods:	EPA 3A, EPA 20, CARB 100, BAAQMD ST-14, SCAQMD 100.1
Principle:	A sample is continuously withdrawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of O ₂ concentration.
Analyzer:	Teledyne Model 326R
Measurement Principle:	Electrochemical cell
Ranges:	0-5, 0-25% 0-100%
Accuracy:	1% of full scale
Output:	0-1 V
Interferences:	Halogens and halogenated compounds will cause a positive interference. Acid gases will consume the fuel cell and cause a slow calibration drift.
Response Time:	90% < 60 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. If Method 20 is used, that method's specific procedures for selecting sample points are used. Otherwise, stratification checks are performed at the start of a test program to select single or multiple-point sample locations.
Analytical Procedure:	An electrochemical cell is used to measure O ₂ concentration. Oxygen in the flue gas diffuses through a Teflon membrane and is reduced on the surface of the cathode. A corresponding oxidation occurs at the anode internally and an electric current is produced that is proportional to the concentration of oxygen. This current is measured and conditioned by the instrument's electronic circuitry to give an output in percent O ₂ by volume.

Method:	Carbon Dioxide (CO₂) by Continuous Analyzer
Applicable Reference	EPA 3A, CARB 100, BAAQMD ST-5, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of CO ₂ concentration.
Analyzer:	PIR 2000
Measurement Principle:	Non-dispersive infrared (NDIR)
Accuracy:	1% of full scale
Ranges:	0-5, 0-15%
Output:	0-1 V
Interferences:	A possible interference includes water. Since the instrument receives dried sample gas, this interference is not significant.
Response Time:	5 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously.
Analytical Procedure:	Carbon dioxide concentrations are measured by short path length non-dispersive infrared analyzers. These instruments measure the differential in infrared energy absorbed from energy beams passed through a reference cell (containing a gas selected to have minimal absorption of infrared energy in the wavelength absorbed by the gas component of interest) and a sample cell through which the sample gas flows continuously. The differential absorption appears as a reading on a scale of 0-100%.

Method:	Carbon Monoxide (CO) by NDIR/Gas Filter Correlation
Applicable Reference Methods:	EPA 6C; CARB 1-100; BAAQMD ST-6, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of CO concentration.
Analyzer:	TECO, Model 48H
Measurement Principle:	NDIR/Gas Filter Correlation
Precision:	0.1 % ppm
Ranges: ppm	0-50, 0-100, 0-250, 0-500, 0-1000, 0-2500, 0-5000, 0-10000, 0-2500, 0-3,000
Output:	0-1 V
Interferences:	Negligible interference from water and CO ₂
Rise/Fall times (0-95%)	1 minute @ 1 lpm flow, 30 second integration time
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. Sample point selection has been described previously.
Analytical Procedure:	Radiation from an infrared source is chopped and then passed through a gas filter which alternates between CO and N ₂ due to rotation of a filter wheel. The radiation then passes through a narrow band-pass filter and a multiple optical pass sample cell where absorption by the sample gas occurs. The IR radiation exits the sample cell and falls on a solid state IR detector.

Method:	Sulfur Dioxide (SO₂) by Pulsed Fluorescent
Applicable Reference Methods:	EPA 10; CARB 1-100; BAAQMD ST-6, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of SO ₂ concentration.
Analyzer:	TECO, Model 43C-HL
Measurement Principle:	Pulsed fluorescence SO ₂ analyzer
Precision:	0.1% ppm
Ranges:	5, 10, 20, 50, 100, 200 ppm
Output:	0-10 V
Interferences:	Less than lower detectable limit except for the following: NO < 3 ppb, m-xylene < 2 ppm, H ₂ O < 2% of reading.
Response Time:	80 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. Sample point selection has been described previously.
Analytical Procedure:	The sample flows into the fluorescent chamber, where pulsating UV light excites the SO ₂ molecules. The condensing lens focuses the pulsating UV light into the mirror assembly. The mirror assembly contains four selecting mirrors that reflect only the wavelengths which excite SO ₂ molecules. As excited SO ₂ molecules decay to lower energy states they emit UV light that is proportional to the SO ₂ concentration. The PMT (photomultiplier tube) detects UV light emission from decaying SO ₂ molecules. The PMT continuously monitors pulsating UV light source and is connected to a circuit that compensates for fluctuating in the light.



AtmAA Inc.

23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

environmental consultants
laboratory services

**Tandem Gas Chromatographic/Mass Spectroscopic-Electrolytic
Conductivity Detector (GC/MS-ELCD) Method for
Determination of Total Sulfur in Gas Samples**

AtmAA, Inc.
03-060

3/30/93

This method measures selected reduced sulfur species, including but not limited to hydrogen sulfide, carbonyl sulfide, methyl mercaptan, ethyl mercaptan, dimethyl sulfide, carbon disulfide, isopropyl mercaptan, n-propyl mercaptan, and dimethyl disulfide in gaseous sample matrices using gas chromatographic separation and a mass spectrometric and electrolytic conductivity detector (ELCD), where the ELCD measures hydrogen sulfide only. A non-polar methyl silicon capillary gas chromatographic column is used for component separation and selected ion monitoring is used for component quantification. Component quantification is obtained using a multi-component external standard prepared by Scott Specialty Gases. The lower detection limit varies by component but is at least 0.1 ppmv ethyl mercaptan (component of lowest sensitivity) for a 0.31 ml sample volume injection. The upper quantitation limit has not been determined but is at least beyond 80 ppmv dimethyl disulfide, for which response remained linear from 0.1 ppmv to 80 ppmv.

Hydrogen sulfide is measured using an electrolytic conductivity detector operated in the oxidative sulfur mode. A Chromosil 310 column, operated isothermally at 45°C. is used to separate H₂S from other sulfur components. A fixed volume loop injection is used in the analysis for H₂S.

Lower Detection Limits (LDL's):

Using a 1 ml injection volume for H₂S by electrolytic conductivity detector and 0.40 ml injection volume for GC/MS measured sulfur compounds, the following LDL's are obtained:

	(ppmv)
Hydrogen sulfide	0.5
Carbonyl sulfide	0.03
Methyl mercaptan	0.03
Ethyl mercaptan	0.04
Dimethyl sulfide	0.02
Carbon disulfide	0.02
i-propyl mercaptan	0.03
n-propyl mercaptan	0.03
Dimethyl disulfide	0.02

Equipment:

A Hewlett-Packard 5890 series II gas chromatograph (GC), Hewlett-Packard 5971A Mass Selective Detector, 486 MS/DOS computer and HP operating software are used for all sulfur species except H_2S . The GC is fitted with a heated 6-port Valco 1/16" line, sample injection valve. All gas transfer lines to the sample loop are fused silica lined Restek tubing. The fixed volume (0.40 ml) sample loop is Teflon. The transfer line from the valve to the GC column is cleaned and treated blank 0.53 mm OD fused silica line with polyimide coating.

H_2S is measured using a Varian 1400 GC with the Hall oxidative quartz tube furnace and electrolytic cell attached. Nitrogen is used as carrier and oxygen is used as the combustion gas.

Multi-component gaseous standards are prepared by Scott Specialty Gas and are contained in two separate aluminum cylinders and a Scotty IV canister as follows:

Cylinder A (CAL12250)

Carbonyl sulfide	15.2 ppmv
Ethyl mercaptan	13.4 ppmv
Carbon disulfide	16.1 ppmv

Cylinder B (CAL3563)

Hydrogen sulfide	12.3 ppmv
Methyl mercaptan	22.6 ppmv
Dimethyl sulfide	20.3 ppmv
Dimethyl disulfide	

Scotty IV (mix 252)

Hydrogen Sulfide 93.8 ppmv

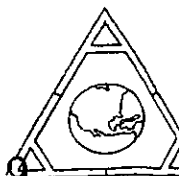
Gas tight clean glass volumetric syringes of 10, 20, & 50 ml capacity, with smooth glass barrel (not sintered glass) are used to make volumetric dilutions of sample or standard.

GC/MS SIM parameters:

	Dwell per ion	start time	Ions
Group 1:	75 msec.	8.0 min.	60
Group 2:	75 msec.	10.0 min.	47,48,64
Group 3:	75 msec.	14.5 min.	47,62,76,78,43,61
Group 4:	75 msec.	19.5 min.	79,94,122,142,156, 128

Components monitored:

Group 1:	carbonyl sulfide
Group 2:	methyl mercaptan
Group 3:	ethyl mercaptan, dimethyl disulfide, carbon disulfide, isopropyl mercaptan, n-propyl mercaptan
Group 4:	dimethyl sulfide



Component	Quantitation ion	Confirmation ion
carbonyl sulfide	60	none
methyl mercaptan	47	48
ethyl mercaptan	62	47
dimethyl sulfide	62	47
carbon disulfide	76	78
iso-propyl mercaptan	76	43,47,61
n-propyl mercaptan	76	43,47,61
dimethyl disulfide	94	79

Sulfur dioxide is analyzed by monitoring mass 64 which is included in Group 2 ions.

Calibration:

Gaseous standards can be analyzed prior to or after a set of samples. Response factors are determined from a single point standard calibration. Multi-point calibrations are performed to verify linearity. Consistency of standard response with continuing calibrations is observed to indicate performance of multi-point calibration.

Samples containing components at less than the stated LDL can be analyzed by cryogenically focusing a measured volume of gaseous sample onto a glass bead filled Teflon loop immersed in liquid argon. The sample is thermally transferred upon injection by immersing the sample loop in near boiling temperature water. The LDL obtained by this technique is calculated as:

$$LDL_{cryo} = (cryo \text{ volume}/0.40) * LDL_{0.40}$$

Acceptable volumes for cryogenic concentration range from 3 to 100 ml. and are determined based on amounts of other components in the sample such as water, carbon dioxide or hydrocarbons.

Procedure:

A volumetric sample of landfill or source collected gas is transferred from a Tedlar[®] bag to the 6-port valve injection line using a glass syringe of approximately 10 ml. A Teflon loop of 0.40 ml volume is used to inject the sample. When sample concentrations exceed that of the standard, appropriate volumetric sample dilutions are made using the glass syringes with dry nitrogen diluent. Immediately after sample injection, the GC/MS is started. Standards are analyzed in the same manner as samples. Appropriate component peaks are monitored and integrated after sample analysis data set has been obtained.

Hydrogen sulfide is measured using the electrolytic conductivity detector by a separate direct fixed loop valve injection using heated Teflon loop, transfer lines, and Teflon Chromosil 310 GC column.



A response factor for a standard component is calculated as:

$$rf = \text{std. amt.} / \text{std. area}$$

Sample concentration is calculated using the response factor:

$$\text{conc.} = rf \times \text{sample area}$$

At least 10% of samples in a sample set, or minimum of one sample per set are analyzed twice to determine precision. A separate report showing repeat analyses results is included with an analytical report of sulfur component concentrations per each sample set. Repeat analyses must agree within $\pm 10\%$ except for component concentrations less than 1 ppmv. A nitrogen blank is analyzed between standards and samples to verify that there is no component carry-over. Samples are analyzed as soon after they are received as possible, preferably same day and within four hours of collection. Data is being gathered to determine stability of sulfur compounds in Tedlar[®] bag containers in an effort to extend sample holding time. Samples are usually analyzed before standards to prevent carry-over, since most sulfur components measured in landfill gas samples are lower in concentration than those in the standards.

GC/MS Analysis Conditions:

GC conditions: a 30 M x 0.2 mm, 0.50 μ m film methyl silicon PONA column from Hewlett-Packard is temperature programmed as follows:

-65 degrees C, hold min.

15 degrees C min. to 220 degrees C, hold 5 min.

Valve oven Temp. 150 degrees C

GC/MS transfer line 180 degrees C

Carrier gas is helium, pressure regulated at 21 psi.

MS Conditions:

MS calibration is performed periodically prior to performing analyses using PFTBA (perfluoro-tributylamine) as supplied by Hewlett-Packard and as controlled by HP software under the mid-range auto tune program.

Solvent delay = 8 min.

Hall Detector/GC Analysis Conditions:

6' x 1/8" Teflon, Chromosil 310 analytical column

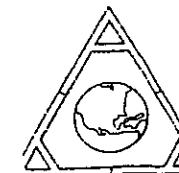
45 degrees C, isothermal

Valve oven & transfer line Temp. 105 degrees C.

Carrier gas is nitrogen, flow rate 18 cc/min.

Oxygen oxidation gas, flow rate 18 cc/min.

Quartz tube oxidation oven Temp. 650 degrees C.



APPENDIX B - Computer Printout of Results

SCAQMD Method 100.1 Emission Rates

Facility: Bradley Landfill
Source: Flare #3
Job No.: W07-042
Date: 4/21/2005

Run Number	*****	1	2
Load	*****	as Found	as Found
EPA F-Factor	dscf/MMBtu	10411	10411
Stack Flow Rate	dscfm	11579	12274
Oxygen	%	11.11	11.15
Carbon Dioxide	%	8.56	8.89

Oxides of Nitrogen

Concentration	ppm	18.4	17.9
Concentration @ 3 % O ₂	ppm	33.6	32.9
Concentration	lb/dscf	2.23E-06	2.17E-06
Emission Rate	lb/MMBtu	4.95E-02	4.84E-02
Emission Rate	lb/hr	1.55	1.60

Carbon Monoxide

Concentration	ppm	<	20.0	<	20.0
Concentration @ 3 % O ₂	ppm	<	36.6	<	36.7
Concentration	lb/dscf	<	1.48E-06	<	1.48E-06
Emission Rate	lb/MMBtu	<	3.28E-02	<	3.29E-02
Emission Rate	lb/hr	<	1.025	<	1.087

SCAQMD Method 5.1 Particulate Emissions

Facility: Bradley Landfill
Source: Flare #3
Job No.: W07-042
Date: 4/21/2005

STANDARD TEMPERATURE	Degrees F	60				
RUN NUMBER	*****	1	2	1	2	
DATE OF RUN	*****	04/21/05	04/21/05	04/21/05	04/21/05	
CLOCK TIME: INITIAL	*****	910	1112	910	1112	
CLOCK TIME: FINAL	*****	1025	1220	1025	1220	
AVG. STACK TEMPERATURE	Degrees F	1646	1621			
AVG. SQUARE DELTA P	Inches H2O	0.1000	0.1000			
NOZZLE DIAMETER	Inches	1.020	1.020			
BAROMETRIC PRESSURE	Inches HG	29.07	29.07			
SAMPLING TIME	Minutes	60	60			
SAMPLE VOLUME	Cubic Feet	53.032	54.681			
AVG. METER TEMP.	Degrees F	93.1	100.8			
AVG. DELTA H	Inches H2O	2.20	2.20			
DGM CALIB. FACTOR [Y]	*****	1.0015	1.0015			
WATER COLLECTED	Milliliters	155	162			
CO 2	Percent	8.56	8.89			
O 2	Percent	11.11	11.15			
CO	Percent					
CH4	Percent					
N 2	Percent	80.33	79.96			
STACK AREA	Square Inches	7238.2	7238.2			
STATIC PRESSURE	Inches WG.	-0.005	-0.005			
PITOT COEFFICIENT	*****	0.84	0.84			
SAMPLE VOLUME DRY	DSCF	48.79	49.61			
WATER AT STD.	SCF	7.3	7.6			
MOISTURE	Percent	13.0	13.3			
MOLE FRACTION DRY GAS	*****	0.87	0.87			
MOLECULAR WT.DRY	lb/lb Mole	29.81	29.87			
EXCESS AIR	Percent	110	112			
MOLECULAR WT. WET	lb/lb Mole	28.27	28.28			
STACK GAS PRESSURE	Inches HG	29.07	29.07			
STACK VELOCITY	AFPM	690	686			
VOLUMETRIC FLOWRATE, DRY STD.	DSCFM	7235	7249	11579	*	12274 *
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	34669	34462			
ISOKINETIC RATIO	Percent	98	100			

CALCULATIONS FOR GRAIN LOADING AND EMISSION RATES

TOTAL PARTICULATE	mg	11.2	28.5	11.2	28.5
PARTICULATE CONCENTRATION	gr/dscf	0.0035	0.0088	0.0035	0.0088
PARTICULATE EMISSION RATE	lb/hr	0.22	0.55	0.35	0.93

*Denotes the use of calculated flowrate based on expansion factor of LFG.

SCAQMD Method 307.91

Facility: Bradley Landfill
Source: Flare #3
Job No.: W07-042
Date: 4/21/2005

Sulfur Compounds

Speciated Compound	Concentration ppm, as H2S	No. of S molecules in Compound	Total S ppm, as H2S	SO2 Conc. mg/dscf	Avg. Inlet Flow Rate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide	23.3	1	23.30	1.784	1563	0.369
Carbonyl Sulfide	0.17	1	0.17	0.013	1563	0.003
Methyl mercaptan	3.51	1	3.51	0.269	1563	0.056
Ethyl mercaptan	< 0.10	1	0.10	0.008	1563	0.002
Dimethyl sulfide	6.66	1	6.66	0.510	1563	0.105
Carbon disulfide	0.09	2	0.18	0.014	1563	0.003
Dimethyl disulfide	0.16	2	0.32	0.025	1563	0.005
iso-propyl mercaptan	< 0.06	1	0.06	0.005	1563	0.001
n-propyl mercaptan	< 0.50	1	0.50	0.038	1563	0.008
Total			34.80			0.551

SCAQMD Methods 1-4 Flowrate Determination

Facility: Bradley Landfill
 Source: Flare #3
 Job No.: W07-042
 Date: 4/21/2005

STANDARD TEMPERATURE	Degrees F	60	60	60
RUN NUMBER	*****	1	2	Average
CLOCK TIME: INITIAL	*****	910	1112	
CLOCK TIME: FINAL	*****	1010	1212	
AVG. STACK TEMPERATURE	Degrees F	118	129	124
AVG. SQUARE DELTA P	Inches H2O	0.8367	0.8944	0.8655
BAROMETRIC PRESSURE	Inches HG	29.07	29.07	29.07
SAMPLING TIME	Minutes	60	60	60
SAMPLE VOLUME	Cubic Feet	47.079	45.987	46.533
AVG. METER TEMP.	Degrees F	89.9	93.0	91.5
AVG. DELTA H	Inches H2O	1.60	1.60	1.60
DGM CALIB. FACTOR [Y]	*****	1.0076	1.0076	1.0076
WATER COLLECTED	Milliliters	58	60	59
CO 2	Percent	28.9	28.9	28.9
O 2	Percent	4.2	4.2	4.2
CO	Percent	0.0	0.0	0.0
CH4	Percent	34.0	34.0	34.0
N 2	Percent	33.0	33.0	33.0
STACK AREA	Square Inches	73.540	73.540	73.5
STATIC PRESSURE	Inches WG	10.00	10.00	10.00
PITOT COEFFICIENT	*****	0.99	0.99	0.99
SAMPLE VOLUME DRY	DSCF	43.76	42.50	43.13
WATER AT STD.	SCF	2.7	2.8	2.8
MOISTURE	Percent	5.9	6.2	6.1
MOLE FRACTION DRY GAS	*****	0.94	0.94	0.94
MOLECULAR WT.DRY	lb/lb Mole	28.72	28.72	28.72
EXCESS AIR	Percent	93	93	93
MOLECULAR WT. WET	lb/lb Mole	28.09	28.05	28.07
STACK GAS PRESSURE	Inches HG	29.81	29.81	29.81
STACK VELOCITY	AFPM	3531	3813	3672
VOLUMETRIC FLOWRATE, DRY STD.	DSCFM	1521	1606	1563
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	1803	1947	1875

EMISSION RATES

SAMPLE A

TNMHC Concentration, as CH4	ppm	2219	2219
TNMHC Concentration, as CH4	mg/dscf	42.41	42.41
TNMHC Emission Rate, as CH4	lb/hr	8.53	8.77

SAMPLE B

TNMHC Concentration, as CH4	ppm	1897	1897
TNMHC Concentration, as CH4	mg/dscf	36.24	36.24
TNMHC Emission Rate, as CH4	lb/hr	7.29	7.49

AVERAGE

TNMHC Concentration, as CH4	ppm	2058	2058
TNMHC Concentration, as CH4	mg/dscf	39.32	39.32
TNMHC Emission Rate, as CH4	lb/hr	7.91	8.13

EXPANSION AND F-FACTOR CALC. METHOD

Client: Bradley Landfill
 Location: Sun Valley, CA
 Unit: Flare #3

Date: 4/21/2005
 Job #: W07-042
 Run#: 1

Fuel temperature _____ deg. F Std. Temp. 60 deg. F
 Fuel Pressure _____ psi
 Fuel Flow Rate _____ cfm
 Exhaust Outlet O2 11.11 % Fuel Flow 1521 dscfm
 Barometric Pressure 29.07

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		<u>4.20</u>			0.042
Nitrogen		<u>32.96</u>			0.330
Carbon Dioxide		<u>28.90</u>			0.289
Methane		<u>33.95</u>	342.90	308.74	2.910
Ethane	C2		0.00	0.00	0.000
Propane	C3		0.00	0.00	0.000
Iso-Butane	C4		0.00	0.00	0.000
N-Butane			0.00	0.00	0.000
Iso-Pentane	C5		0.00	0.00	0.000
N-Pentane			0.00	0.00	0.000
Hexane	C6		0.00	0.00	0.000
Heptane	C7		0.00	0.00	0.000
Octane	C8		0.00	0.00	0.000
Nonane	C9		0.00	0.00	0.000
Total		100.00	342.90	308.74	3.57

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92/(20.92-%O2))

11579 DSCFM

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

10411 dscf/MMbtu

EXPANSION AND F-FACTOR CALC. METHOD

Client: Bradley Landfill
 Location: Sun Valley, CA
 Unit: Flare #3

Date: 4/21/2005
 Job #: W07-042
 Run#: 2

Fuel temperature _____ deg. F Std. Temp. 60 deg. F
 Fuel Pressure _____ psi
 Fuel Flow Rate _____ cfm Fuel Flow 1606 dscfm
 Exhaust Outlet O2 11.15 %
 Barometric Pressure 29.07

COMPONENTS	MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen	<u>4.20</u>			0.042
Nitrogen	<u>32.96</u>			0.330
Carbon Dioxide	<u>28.90</u>			0.289
Methane	<u>33.95</u>	342.90	308.74	2.910
Ethane C2		0.00	0.00	0.000
Propane C3		0.00	0.00	0.000
Iso-Butane C4		0.00	0.00	0.000
N-Butane		0.00	0.00	0.000
Iso-Pentane C5		0.00	0.00	0.000
N-Pentane		0.00	0.00	0.000
Hexane C6		0.00	0.00	0.000
Heptane C7		0.00	0.00	0.000
Octane C8		0.00	0.00	0.000
Nonane C9		0.00	0.00	0.000
Total	100.00	342.90	308.74	3.57

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92(20.92-%O2)

12274 DSCFM

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

10411 dscf/Mmbtu

SCAQMD Method 25.1 Analysis

Facility: Bradley Landfill
Source: Flare #3
Job No.: W07-042
Date: 4/21/2005

TOTAL COMBUSTION ANALYSIS RESULTS

Sample ID Run Number	Inlet 1A	Inlet 1B	Average
Methane in Tank	351000	328000	339500
TNMHC, Tank (Noncond.)	802	825	
TNMHC - Condensables	1417.3	1071.9	
TNMHC - Total	2219.3	1896.5	
CO Concentration (ppm)	214	201	207.5
CO2 Concentration (ppm)	299000	279000	289000
O2 Concentration (%)	3.81	4.58	4.20
Sample Parameters			
Tank Number	K	J	
Trap Number	K	N	
Sample Tank Volume (l)	12.202	12.051	
Initial Pressure (Torr)	2.5	2.5	
Initial Temperature (deg. K)	292	292	
Final Pressure (mm Hg)	312	377	
Final Temperature (deg. K)	292	292	
Sample Volume (l)	4.99	5.96	
Analysis Pressure (mm Hg)	820	820	
Analysis Temperature (deg. K)	292	292	
ICV Volume (l)	2.266	2.266	
ICV Final Pressure (mm Hg)	800	800	
ICV Final Temperature (deg. K)	292	292	
CO2 in ICV (ppm)	3120	2820	
TNMHC, Trap (Condensables)	1417	1072	
Stack Total TNMHC	2219	1897	2058

NOTE: All hydrocarbon values are in terms of ppm, v/v, as methane.

Facility: Bradley Landfill
Source: Flare #3
Job No.: W07-042
Date: 04/21/05

Run No.: 1
Fuel: LFG
Std. O2: 15

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25	20	25	100
Span:	12.05	6.99	13.00	50.80
Low:				
High:	20.01	12.01	20.00	80.20

**** POST-TEST DRIFT (DIRECT)****

Values

Zero:

Span:

0.00	0.00	0.13	0.00
11.88	6.80	13.00	50.00

Percent Drift

Zero:

Span:

0.00	0.00	0.50	0.00
-0.68	-0.95	0.00	-0.80

**** PRE-TEST BIAS ****

Values

Zero:

Span:

0.00	0.20	0.00	0.00
12.00	6.80	12.75	50.00

**** POST-TEST BIAS ****

Values

Zero:

Span:

0.00	0.00	0.13	0.00
11.88	6.80	13.00	50.00

**** BIAS CORRECTION ****

Zero Average

Span Average

0.00	0.10	0.06	0.00
11.94	6.80	12.88	50.00

**** POST-TEST DRIFT (BIAS)****

Percent Drift

Zero:

Span:

0.00	1.00	-0.50	0.00
0.48	0.00	-1.00	0.00

Bias-Corrected Concentration

Bias-Corrected Conc.(O2 adjusted)

11.11	8.56	18.36	1.74
		11.06	1.05

**** RAW AVERAGE CONCENTRATION ****

Average:		11.01	8.30	18.15	1.72	
O2 adjust:	15.0			10.83	1.02	
Date	Time	O2	CO2	NOx	CO	
21-Apr-05	910	11.13	6.90	16.75	2.52	Port A
21-Apr-05	911	11.14	8.27	16.60	1.95	
21-Apr-05	912	11.33	8.08	16.57	1.79	
21-Apr-05	913	11.20	8.26	17.35	1.57	
21-Apr-05	914	10.95	8.49	17.96	1.80	
21-Apr-05	915	10.90	8.39	18.68	2.60	
21-Apr-05	916	10.87	8.35	18.39	2.00	
21-Apr-05	917	11.04	8.33	18.07	1.75	
21-Apr-05	918	10.98	8.41	17.92	1.85	
21-Apr-05	919	10.95	8.37	18.03	1.84	
21-Apr-05	920	10.81	8.53	18.49	2.25	
21-Apr-05	921	10.86	8.38	18.35	2.10	
21-Apr-05	922	11.05	8.26	18.12	2.60	
21-Apr-05	923	11.14	8.17	17.81	4.79	
21-Apr-05	924	10.95	8.51	18.01	3.93	
21-Apr-05	925	10.69	8.66	19.27	2.44	
21-Apr-05	926	10.61	8.67	19.36	1.88	
21-Apr-05	927	10.66	8.65	18.98	1.41	
21-Apr-05	928	10.72	8.47	18.82	1.65	
21-Apr-05	929	10.76	8.49	18.35	1.41	
21-Apr-05	930	10.75	8.59	18.53	0.98	
21-Apr-05	931	10.78	8.44	18.43	0.93	
21-Apr-05	932	10.97	8.31	18.16	0.82	
21-Apr-05	933	10.90	8.36	18.24	0.98	
21-Apr-05	934	10.87	8.49	18.50	1.04	
21-Apr-05	935	10.63	8.73	18.88	1.16	
21-Apr-05	936	10.67	8.50	18.53	0.90	
21-Apr-05	937	10.89	8.27	17.97	1.23	
21-Apr-05	938	11.12	8.23	17.42	1.41	
21-Apr-05	939	11.09	8.22	17.49	1.78	
21-Apr-05	940	10.92	8.43	17.94	1.29	
21-Apr-05	955	10.50	8.74	20.47	-0.47	Port B
21-Apr-05	956	11.04	8.13	18.69	-0.25	
21-Apr-05	957	11.26	8.16	18.44	0.67	
21-Apr-05	958	11.07	8.30	17.96	1.34	
21-Apr-05	959	10.99	8.31	18.07	1.89	
21-Apr-05	1000	10.99	8.37	18.45	1.89	
21-Apr-05	1001	10.84	8.48	18.61	1.89	
21-Apr-05	1002	11.15	8.10	18.02	2.18	
21-Apr-05	1003	11.33	7.97	17.79	2.44	

21-Apr-05	1004	11.18	8.21	18.24	3.31
21-Apr-05	1005	11.10	8.31	18.43	2.58
21-Apr-05	1006	11.00	8.37	18.46	2.69
21-Apr-05	1007	10.86	8.34	18.23	3.38
21-Apr-05	1008	10.82	8.63	18.71	2.94
21-Apr-05	1009	11.11	8.19	17.88	1.89
21-Apr-05	1010	10.99	8.33	18.04	1.15
21-Apr-05	1011	11.14	8.25	17.86	1.11
21-Apr-05	1012	10.99	8.35	18.28	0.80
21-Apr-05	1013	11.11	8.24	17.97	1.06
21-Apr-05	1014	10.90	8.44	18.36	0.98
21-Apr-05	1015	11.02	8.13	18.04	0.61
21-Apr-05	1016	11.37	8.02	17.87	0.90
21-Apr-05	1017	11.32	8.11	17.90	1.11
21-Apr-05	1018	11.26	8.06	17.79	0.91
21-Apr-05	1019	11.30	8.06	17.46	1.30
21-Apr-05	1020	11.36	8.03	17.83	1.26
21-Apr-05	1021	11.44	8.02	17.69	1.25
21-Apr-05	1022	11.34	8.21	17.90	1.89
21-Apr-05	1023	10.84	8.37	18.47	2.46
21-Apr-05	1024	11.30	8.17	17.87	2.10
21-Apr-05	1025	11.21	8.16	17.74	2.48

Facility: Bradley Landfill
Source: Flare #3
Job No.: W07-042
Date: 04/21/05

Run No.: 2
Fuel: LFG
Std. O2: 15

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25	20	25	100
Span:	12.05	6.99	13.00	50.80
Low:				
High:	20.01	12.01	20.00	80.20

**** POST-TEST DRIFT (DIRECT)****

Values	O2	CO2	NOx	CO
Zero:	0.00	-0.20	0.00	0.00
Span:	11.88	6.80	13.13	50.00

Percent Drift	O2	CO2	NOx	CO
Zero:	0.00	-1.00	0.00	0.00
Span:	-0.68	-0.95	0.50	-0.80

**** PRE-TEST BIAS ****

Values	O2	CO2	NOx	CO
Zero:	0.00	0.00	0.13	0.00
Span:	11.88	6.80	13.00	50.00

**** POST-TEST BIAS ****

Values	O2	CO2	NOx	CO
Zero:	0.00	-0.20	0.00	0.00
Span:	11.88	6.80	13.13	50.00

**** BIAS CORRECTION ****

	O2	CO2	NOx	CO
Zero Average	0.00	-0.10	0.06	0.00
Span Average	11.88	6.80	13.06	50.00

**** POST-TEST DRIFT (BIAS)****

Percent Drift	O2	CO2	NOx	CO
Zero:	0.00	1.00	0.50	0.00
Span:	0.00	0.00	-0.50	0.00

Bias-Corrected Concentration	O2	CO2	NOx	CO
	11.15	8.89	17.91	3.27
Bias-Corrected Conc.(O2 adjusted)			10.84	1.98

**** RAW AVERAGE CONCENTRATION ****

Average:		O2	CO2	NOx	CO
O2 adjust:	15.0	10.99	8.68	17.98	3.22
Date	Time	O2	CO2	NOx	CO
21-Apr-05	1112	11.72	7.98	16.22	11.95 Port A
21-Apr-05	1113	11.62	8.06	16.37	13.45
21-Apr-05	1114	11.50	8.21	16.67	3.19
21-Apr-05	1115	11.26	8.53	17.94	8.70
21-Apr-05	1116	10.94	8.81	18.84	3.40
21-Apr-05	1117	10.86	8.82	18.95	-0.06
21-Apr-05	1118	10.99	8.68	18.66	-0.53
21-Apr-05	1119	11.09	8.57	18.41	-0.44
21-Apr-05	1120	11.28	8.33	18.07	-0.19
21-Apr-05	1121	11.60	8.10	16.82	7.18
21-Apr-05	1122	11.55	8.13	16.68	14.96
21-Apr-05	1123	11.16	8.64	17.35	21.73
21-Apr-05	1124	10.91	8.74	17.43	10.76
21-Apr-05	1125	10.75	9.02	18.39	1.67
21-Apr-05	1126	10.51	9.21	18.87	0.04
21-Apr-05	1127	10.41	9.30	18.80	-0.13
21-Apr-05	1128	10.43	9.22	18.89	0.12
21-Apr-05	1129	10.67	9.01	18.47	-0.04
21-Apr-05	1130	10.44	9.24	18.41	-0.32
21-Apr-05	1131	10.56	9.06	17.98	-0.30
21-Apr-05	1132	10.59	9.06	18.25	-0.23
21-Apr-05	1133	10.49	9.20	18.21	-0.15
21-Apr-05	1134	10.46	9.16	18.07	-0.13
21-Apr-05	1135	10.82	8.86	17.53	0.26
21-Apr-05	1136	10.76	8.82	17.16	0.99
21-Apr-05	1137	10.82	8.88	17.37	2.43
21-Apr-05	1138	10.77	8.88	17.72	2.01
21-Apr-05	1139	10.80	8.90	18.24	2.11
21-Apr-05	1140	10.80	8.79	18.43	2.38
21-Apr-05	1141	10.90	8.84	18.37	2.15
21-Apr-05	1142	10.96	8.56	17.97	2.12
21-Apr-05	1150	11.14	8.56	18.36	0.15 Port B
21-Apr-05	1151	11.18	8.45	18.21	-0.56
21-Apr-05	1152	11.30	8.45	18.11	-0.23
21-Apr-05	1153	11.22	8.38	17.98	0.53
21-Apr-05	1154	11.12	8.57	18.28	-0.20
21-Apr-05	1155	11.08	8.57	18.16	-0.09
21-Apr-05	1156	10.96	8.70	18.49	-0.06
21-Apr-05	1157	10.98	8.67	18.50	-0.37
21-Apr-05	1158	11.16	8.34	17.63	-0.29

21-Apr-05	1159	11.75	7.91	15.95	6.55
21-Apr-05	1200	11.71	8.03	16.09	14.90
21-Apr-05	1201	11.45	8.23	17.26	6.95
21-Apr-05	1202	11.21	8.55	17.91	1.34
21-Apr-05	1203	10.94	8.61	18.07	-0.18
21-Apr-05	1204	10.77	9.03	19.20	0.69
21-Apr-05	1205	10.65	8.98	19.10	-0.15
21-Apr-05	1206	10.80	8.84	18.69	-0.27
21-Apr-05	1207	10.72	8.96	18.82	-0.28
21-Apr-05	1208	10.82	8.80	18.43	-0.20
21-Apr-05	1209	11.11	8.39	17.19	0.91
21-Apr-05	1210	11.52	8.13	16.27	12.11
21-Apr-05	1211	11.57	8.08	16.09	22.32
21-Apr-05	1212	11.49	8.18	16.47	18.18
21-Apr-05	1213	11.13	8.55	17.84	9.02
21-Apr-05	1214	10.74	8.97	19.01	1.24
21-Apr-05	1215	10.52	9.16	19.26	-0.35
21-Apr-05	1216	10.59	9.06	19.00	-0.48
21-Apr-05	1217	10.59	9.12	19.41	-0.51
21-Apr-05	1218	10.55	9.04	19.45	-0.43
21-Apr-05	1219	10.95	8.57	18.00	-0.22
21-Apr-05	1220	11.16	8.45	17.73	0.65

PRETEST		CALIBRATION ERROR			
LEAK CHECK					
<hr/>					
RANGE :	25	20	100	25	
	O2	CO2	CO	NOx	
<hr/>					
ZERO					
Instrument	0.00	0.00	0.00	0.00	
Cylinder	0.00	0.00	0.00	0.00	
Difference (%)	0.00	0.00	0.00	0.00	
<hr/>					
LOW LEVEL					
Instrument					
Cylinder					
Difference (%)	0.00	0.00	0.00	0.00	
<hr/>					
MID LEVEL					
Instrument	12.10	7.00	51.00	13.00	
Cylinder	12.05	6.99	50.80	13.00	
Difference (%)	0.20	0.05	0.20	0.00	
<hr/>					
HIGH LEVEL					
Instrument	20.13	12.30	80.50	20.38	
Cylinder	20.01	12.01	80.20	20.00	
Difference (%)	0.46	1.45	0.30	1.52	

PRETEST		LINEARITY	
	Cylinder	Instrument	
	O2		
Zero	0.00		0.00
High Level	20.01		20.13
Slope	0.99		
Intercept	0.00	Status	
Predicted Value	12.12	<1	
Linearity (%)	0.08	PASS	
	CO2		
Zero	0.00		0.00
High Level	12.01		12.30
Slope	0.98		
Intercept	0.00	Status	
Predicted Value	7.18	<1	
Linearity (%)	0.79	PASS	
	CO		
Zero	0.00		0.00
High Level	80.20		80.50
Slope	1.00		
Intercept	0.00	Status	
Predicted Value	50.99	<1	
Linearity (%)	0.01	PASS	
	NOX		
Zero	0.00		0.00
High Level	20.00		20.38
Slope	0.98		
Intercept	0.00	Status	
Predicted Value	13.25	<1	
Linearity (%)	0.89	PASS	

SYSTEM RESPONSE TIME			
	#1	#2	#3
Upscale			
NOx	23		
CO	54		
O2	30		
CO2	22		
Downscale			
NOx	21		
CO	51		
O2	28		
CO2	21		

NO2 CONVERTER EFFICIENCY			
Cylinder(Co)	ppm	%	status
NO Mode(C1)	18.50		
NOx Mode(C2)	0.30		
	18.13		
D1	18.20		
D2	17.83		
D3	0.37		
CE		97.97	
CE > 90 %			PASS

POST TEST		CALIBRATION ERROR			
LEAK CHECK					
	O2	CO2	CO	NOx	
ZERO					
Instrument	0.00	0.00	0.00	0.13	
Cylinder	0.00	0.00	0.00	0.00	
Difference (%)	0.00	0.00	0.00	0.50	
LOW LEVEL					
Instrument					
Cylinder					
Difference (%)	0.00	0.00	0.00	0.00	
MID LEVEL					
Instrument	12.00	6.90	50.20	12.88	
Cylinder	12.05	6.98	50.80	13.00	
Difference (%)	-0.20	-0.45	-0.60	-0.48	
HIGH LEVEL					
Instrument	20.00	12.19	80.00	20.00	
Cylinder	20.01	12.01	80.20	20.00	
Difference (%)	-0.04	0.90	-0.20	0.00	

POST TEST		LINEARITY	
	Cylinder	Instrument	
	O2		
Zero	0.00	0.00	
High Level	20.01	20.00	
Slope	1.00		
Intercept	0.00	Status	
Predicted Value	12.04	<1	
Linearity (%)	0.18	PASS	
	CO2		
Zero	0.00	0.00	
High Level	12.01	12.19	
Slope	0.99		
Intercept	0.00	Status	
Predicted Value	7.09	<1	
Linearity (%)	0.97	PASS	
	CO		
Zero	0.00	0.00	
High Level	80.20	80.00	
Slope	1.00		
Intercept	0.00	Status	
Predicted Value	50.87	<1	
Linearity (%)	0.47	PASS	
	NOX		
Zero	0.00	0.13	
High Level	20.00	20.00	
Slope	1.01		
Intercept	-0.13	Status	
Predicted Value	13.04	<1	
Linearity (%)	0.88	PASS	

Table 5-2
Trace Organic Species
Destruction Efficiency Results
Waste Management - Bradley Landfill
Flare #3
April 21, 2005

Species	INLET		1563		OUTLET		11926.42	
	Flow rate	Conc.	Flow rate	Conc.	Flow rate	Conc.	Flow rate	Conc.
		(ppb)		(mg/dscf)		(ppb)		(mg/dscf)
			Em. Rate				Em. Rate	
			(lb/hr)				(lb/hr)	
								Dest. Eff.
								(%)
Hydrogen Sulfide	23300	9.50E-01	1.96E-01	< 500	< 2.04E-02	< 3.21E-02	> 83.63	
Benzene	7240	6.75E-01	1.40E-01	2.3	2.11E-04	3.32E-04	99.76	
Benzylchloride	< 40	< 6.07E-03	< 1.26E-03	< 0.8	< 1.21E-04	< 1.92E-04	NA	
Chlorobenzene	321	4.34E-02	8.96E-03	< 0.3	< 4.05E-05	< 6.39E-05	> 99.29	
Dichlorobenzenes	1380	2.42E-01	5.01E-02	< 1.1	< 1.93E-04	< 3.05E-04	> 99.39	
1,1-dichloroethane	140	1.66E-02	3.43E-03	< 0.3	< 3.55E-05	< 5.60E-05	> 98.37	
1,2-dichloroethane	50	5.96E-03	1.23E-03	< 0.3	< 3.55E-05	< 5.60E-05	> 95.46	
1,1-dichloroethylene	45	5.17E-03	1.07E-03	< 0.3	< 3.48E-05	< 5.49E-05	> 94.87	
Dichloromethane	250	2.54E-02	5.25E-03	1.28	1.30E-04	2.05E-04	96.09	
1,2-Dibromoethane	< 30	< 6.74E-03	< 1.39E-03	< 0.3	< 6.74E-05	< 1.06E-04	NA	
Perchloroethene	1120	3.17E-01	6.56E-02	< 0.2	< 5.66E-05	< 8.94E-05	> 99.86	
Carbon tetrachloride	< 30	< 5.52E-03	< 1.14E-03	< 0.2	< 3.68E-05	< 5.81E-05	NA	
Toluene	22000	2.42E+00	5.00E-01	0.37	4.07E-05	6.42E-05	99.99	
1,1,1-trichloroethane	< 30	< 4.77E-03	< 9.86E-04	< 0.2	< 3.18E-05	< 5.02E-05	NA	
Trichloroethene	418	6.54E-02	1.35E-02	< 0.2	< 3.13E-05	< 4.94E-05	> 99.63	
Chloroform	< 30	< 4.27E-03	< 8.82E-04	< 0.2	< 2.84E-05	< 4.49E-05	NA	
Vinyl Chloride	382	2.85E-02	5.90E-03	< 0.3	< 2.24E-05	< 3.54E-05	> 99.40	
m+p-xylenes	12400	1.57E+00	3.25E-01	0.36	4.56E-05	7.19E-05	99.98	
o-xylene	4500	5.70E-01	1.18E-01	< 0.3	< 3.80E-05	< 6.00E-05	> 99.95	
TNMHC	2057907	3.94E+01	8.14E+00	2626	5.02E-02	7.92E-02	99.03	

Note: All values preceded by "<" are below the detection limit. The reported values are the detection limit.
NA--Not Applicable: Destruction efficiency can not be calculated since both inlet and outlet values are below the detection limit.

APPENDIX C - Laboratory Results

Facility: BRADLEY
Source: FLARE 3
Job No.: W07-042
Test Date: 04/20-21/05

SCAQMD Method 5.1

DATA SHEET FOR PARTICULATE MATTER SCAQMD METHOD 5.1

DATE SAMPLED: 04/20-21/05
DATE EXTRACTED: 04/21/05

RUN #1

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH	W07042-M5-F3-1-PF	G5003	NA	0.0845	0.0856	0.0011
FILTER ACID						0.0000
FILTER SULFATE						0.0000
B - PROBE CATCH						0.0000
PROBE ACID						0.0000
PROBE SULFATE						0.0000
C - IMP. CATCH(INSOL)	W07042-M5-F3-1-EF	G5039	892	0.0835	0.0851	0.0016
INSOLUBLE ACID						0.0000
INSOLUBLE SULFATE						0.0000
D - IMP. CATCH (SOL)	W07042-M5-F3-1-R	B5077	892	29.2153	29.2222	0.0069
SOLUBLE ACID						0.0000
SOLUBLE SULFATE						0.0000
E - ORGANIC EXTRACT	W07042-M5-F3-1-MC	B5060	125	30.7603	30.7619	0.0016
TOTAL PARTICULATE (A+B+C+D+E)						0.0112
SOLID PARTICULATE (A+B+C+D)						0.0096

Facility: BRADLEY
Source: FLARE 3
Job No.: W07-042
Test Date: 04/20-21/05

SCAQMD Method 5.1

DATA SHEET FOR PARTICULATE MATTER SCAQMD METHOD 5.1

DATE SAMPLED: 04/20-21/05
DATE EXTRACTED: 04/21/05

RUN #2

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH	W07042-M5-F3-2-PF	G3200	NA	0.0848	0.0860	0.0012
FILTER ACID						0.0000
FILTER SULFATE						0.0000
B - PROBE CATCH						0.0000
PROBE ACID						0.0000
PROBE SULFATE						0.0000
C - IMP.CATCH(INSOL)	W07042-M5-F3-2-EF	G5040	850	0.0827	0.1015	0.0188
INSOLUBLE ACID						0.0000
INSOLUBLE SULFATE						0.0000
D - IMP. CATCH (SOL)	W07042-M5-F3-2-R	B5083	850	30.2511	30.2582	0.0071
SOLUBLE ACID						0.0000
SOLUBLE SULFATE						0.0000
E - ORGANIC EXTRACT	W07042-M5-F3-2-MC	B5080	125	31.0275	31.0289	0.0014
TOTAL PARTICULATE (A+B+C+D+E)						0.0285
SOLID PARTICULATE (A+B+C+D)						0.0271

Facility: BRADLEY
Source: FLARE 1, 2 AND 3
Job No.: W07-042
Test Date: 04/20-21/05

SCAQMD Method 5.1

DATA SHEET FOR PARTICULATE MATTER SCAQMD METHOD 5.1

DATE SAMPLED: 04/20-21/05
DATE EXTRACTED: 04/21/05

BLANK

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH FILTER ACID FILTER SULFATE	W07042-M5.1-FB-PF	G03223	NA	0.0837	0.0837	0.0000 0.0000
B - PROBE CATCH PROBE ACID PROBE SULFATE						0.0000 0.0000
C - IMP.CATCH(INSOL) INSOLUBLE ACID INSOLUBLE SULFATE	W07042-M5.1-FB-EF	G5021	500	0.0825	0.0824	0.0000 0.0000 0.0000
D - IMP. CATCH (SOL) SOLUBLE ACID SOLUBLE SULFATE	W07042-M5.1-FB-R	B5156	500	22.2328	22.2330	0.0002 0.0000 0.0000
E - ORGANIC EXTRACT	W07042-M5.1-FB-MC	B5080	125	22.4459	22.4460	0.0001
TOTAL PARTICULATE (A+B+C+D+E)						0.0003
SOLID PARTICULATE (A+B+C+D)						0.0002

CHAIN OF CUSTODY RECORD

Client/Project Name <i>Waste Management Bradley landfill Plant #2 - San Pablo, CA</i>			Project Location <i>Waste Management Bradley landfill Plant #2 - San Pablo, CA</i>			ANALYSES							
Project No. <i>W07-042</i>			Field Logbook No.										
Sampler: (Signature) <i>[Signature]</i>			Chain of Custody Tape No.			SCANNING METHOD 51							
Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	REMARKS								
<i>W07042-MS.1-F1-1-R</i>	<i>4/20/05</i>		<i>METHOD 51</i>	<i>✓</i>					<i>upper tank - Row 1</i> <i>Filter - Row 1</i> <i>middle tank - Row 2</i> <i>Filter - Row 2</i>				
<i>W07042-MS.1-F1-1-PF</i>				<i>✓</i>									
<i>W07-042-MS.1-F1-2-R</i>				<i>✓</i>									
<i>W07042-MS.1-F1-2-PF</i>				<i>✓</i>									
Relinquished by: (Signature) <i>[Signature]</i>			Date <i>4/20/05</i>	Time <i>1530</i>	Received by: (Signature) <i>[Signature]</i>			Date <i>04-21-05</i>	Time <i>1530</i>				
Relinquished by: (Signature)			Date	Time	Received by: (Signature)			Date	Time				
Relinquished by: (Signature)			Date	Time	Received for Laboratory: (Signature)			Date	Time				
Sample Disposal Method:			Disposed of by: (Signature)			Date			Time				
SAMPLE COLLECTOR			ANALYTICAL LABORATORY										
HORIZON AIR MEASUREMENT SERVICES, INC 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781 Fax (805) 498-3173			<i>HORIZON</i>						Nº 8639				

UTU



AtmAA Inc.

23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Organic Carbon Analysis in Water Impinger and Methane & TGNMO Analysis in
SUMMA Canister Samples from Impinger/Canister Train Sample Collection

Report Date: May 3, 2005

Client: Horizon Air Measurement Services, Inc.

Client Project No.: W07-042

Source Location: Waste Management / Bradley Landfill, Sun Valley, CA.

Source ID: Flare no. 3 Outlet

Date Received: April 21, 2005

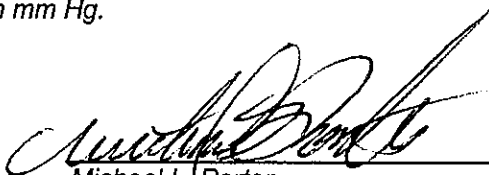
Date Analyzed: April 21, & 25, 2005

Methane and total gaseous non-methane organics were measured by flame ionization detection/total combustion analysis (FID/TCA). Organic carbon in water vial samples were measured by Dohrman total organic carbon analyzer, water FID/TCA.

AtmAA	Sample	Canister	Canister	Canister	Impinger Organic	Impinger		
Lab No.	ID	Methane	Ethane	TGNMO	Carbon as Methane	Volume	P ₁	P ₂
(concentration, ppmv)							(ml)	
01115-31	S2 Outlet	<1	<1	2.28	---	---	493	820
	Impinger H4	---	---	---	0.20	2.84	--	--
01115-32	S12 Outlet	<1	<1	2.23	---	---	608	820
	Impinger H5	---	---	---	0.15	3.15	--	--

TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppm methane. Ethane is reported as ppmv methane.

* Note - Impinger sample results are not field blank corrected. The field blank (impinger H88) contained 0.29 ug carbon as methane, corresponding to 0.10 ppm methane for a 4.40 liter sample. P₁ and P₂ are initial and final pressures measured in mm Hg.


Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analysis)

Source Location : Waste Management / Bradley Landfill, Sun Valley , CA.

Date Received: April 21, 2005

Date Analyzed: April 21, & 25, 2005

Components	Sample ID	Repeat	Analysis	Mean	% Diff.
		Run #1	Run #2	Conc.	From Mean
(Concentration in ppmv)					
Methane	S2 Outlet	<1	<1	---	---
	S12 Outlet	<1	<1	---	---
Ethane	S2 Outlet	<1	<1	---	---
	S12 Outlet	<1	<1	---	---
TGNMO	S2 Outlet	2.29	2.27	2.28	0.44
	S12 Outlet	2.14	2.32	2.23	4.0
Impinger TOC	Impinger H4	0.19	0.2	0.20	2.6
	Impinger H5	0.15	0.14	0.15	3.4

A set of 2 SUMMA canister/impinger samples, laboratory number 01115-(31 & 32), was analyzed for methane and total gaseous non-methane organics (TGNMO) & TOC. Agreement between repeat analysis is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 4 repeat measurements from the sample set of 2 SUMMA canister/impinger samples is 2.6%.





AtmAA Inc.

23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

CO, CH₄, CO₂, and TGNMO Analysis in Tanks
and Traps by SCAQMD Method 25 (FID/TCA)

Report Date: May 3, 2005
Client: Horizon Air Measurement Services, Inc.
Client Project No.: W07-042
Source Location: Waste Management / Bradley Landfill, Sun Valley CA.
Source ID: Flare inlet

Date Received: April 25, & 27, 2005
Date Analyzed: April 25, & 28, 2005

AtmAA Lab No.	Sample ID			tank CO	tank CH ₄	tank CO ₂	tank Ethane	tank TGNMO	trap CO ₂ in ICV	tank Oxygen	P ₁	P ₂
	Tank	Trap	ICV	(Concentrations in ppmv)						(%v)		
01155-9	K	K	21	214	351000	299000	13.1	671	3120	3.81	312	820
01155-10	J	N	28	201	328000	279000	11.6	813	2820	4.58	377	820


trap burn system blank 17

18.0

TGNMO is total gaseous non-methane (excluding ethane) organics reported as ppm methane.
Ethane is reported as ppmv methane.

P₁ - Initial Pressure, mm Hg

P₂ - Final Pressure, mm Hg


Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Client Project No.: W07-042
Date Received: April 25, & 27, 2005
Date Analyzed: April 25, & 28, 2005

Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
(Concentration in ppmv)					
CO	TK K	214	213	214	0.13
	TK J	201	201	201	0.0
CH ₄	TK K	351000	351000	351000	0.0
CO ₂	TK K	299000	297000	298000	0.34
Ethane	TK K	12.9	13.4	13.1	2.1
	TK J	11.6	11.6	11.6	0.15
TGNMO	TK K	677	665	671	0.88
	TK J	814	811	813	0.23
CO ₂ in ICV (in trap, transfer tanks)	ICV 21	3100	3150	3120	0.81
(Concentration in %v)					
Oxygen	TK K	3.80	3.81	3.81	0.08

A set of 2 TCA samples, laboratory numbers 01155-(9-10), was analyzed for CO, CH₄, CO₂, and total gaseous non-methane organics (TGNMO). Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". The average % Difference from Mean for 10 repeat measurements from the sample set of 2 TCA samples is 0.48%.

Gas standards (containing CO, CH₄, CO₂ and isobutane) used for TCA analyses, were prepared and certified by Praxair.





AtmAA Inc.

23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

LABORATORY ANALYSIS REPORT

environmental consultants
laboratory services

SCAQMD Rule 1150.1 Components Analysis in Inlet Gas Tedlar Bag Sample


Report Date: May 2, 2005
Client: Horizon / WMNA
Project Location: Bradley LF #3 Flare
Client Project No.: W07-042
Date Received: April 21, 2005
Date Analyzed: April 21 & 22, 2005

AtmAA Lab No.: 01115-29
Sample I.D.: W07042
F3-M307.91-I

Components	(Concentration in ppmv)
Hydrogen sulfide	23.3

	(Concentration in ppbv)
Benzene	7240
Benzylchloride	<40
Chlorobenzene	321
Dichlorobenzenes*	1380
1,1-dichloroethane	140
1,2-dichloroethane	50.4
1,1-dichloroethylene	44.6
Dichloromethane	250
1,2-dibromoethane	<30
Perchloroethylene	1120
Carbon tetrachloride	<30
Toluene	22000
1,1,1-trichloroethane	<20
Trichloroethene	418
Chloroform	<30
Vinyl chloride	382
m+p-xylenes	12400
o-xylene	4500

* total amount containing meta, para, and ortho isomers


Michael L. Porter
Laboratory Director



AtmAA Inc.

23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Hydrogen Sulfide and Reduced Sulfur Compounds
Analysis in Inlet Tedlar Bag Sample

Report Date: May 2, 2005
Client: Horizon / WMNA
Project Location: Bradley LF #3 Flare
Client Project No.: W07-042
Date Received: April 21, 2005
Date Analyzed: April 21, 2005

ANALYSIS DESCRIPTION

Hydrogen sulfide was analyzed by gas chromatography with a Hall electrolytic conductivity detector operated in the oxidative sulfur mode. All other components were measured by GC/ Mass Spec.

AtmAA Lab No.: 01115-29
Sample I.D.: W07042

F3-M307.91-I

Components

(Concentration in ppmv)

Hydrogen sulfide	23.3
Carbonyl sulfide	0.17
Methyl mercaptan	3.51
Ethyl mercaptan	<0.1
Dimethyl sulfide	6.66
Carbon disulfide	0.091
isopropyl mercaptan	0.16
n-propyl mercaptan	<0.06
Dimethyl disulfide	0.50
TRS	35.0

TRS - total reduced sulfur


Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Client Project No.: W07-042
Date Received: April 21, 2005
Date Analyzed: April 21 & 22, 2005

Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
(Concentration in ppbv)					
Benzene	F3-M307.91-I	7300	7180	7240	0.83
Benzylchloride	F3-M307.91-I	<40	<40	---	---
Chlorobenzene	F3-M307.91-I	323	319	321	0.62
Dichlorobenzenes	F3-M307.91-I	1390	1370	1380	0.72
1,1-dichloroethane	F3-M307.91-I	140	141	140	0.36
1,2-dichloroethane	F3-M307.91-I	50.2	50.7	50.4	0.50
1,1-dichloroethylene	F3-M307.91-I	45.0	44.3	44.6	0.78
Dichloromethane	F3-M307.91-I	250	251	250	0.20
1,2-dibromoethane	F3-M307.91-I	<30	<30	---	---
Perchloroethylene	F3-M307.91-I	1120	1120	1120	0.0
Carbon tetrachloride	F3-M307.91-I	<30	<30	---	---
Toluene	F3-M307.91-I	22100	22000	22000	0.23
1,1,1-trichloroethane	F3-M307.91-I	<20	<20	---	---
Trichloroethene	F3-M307.91-I	416	420	418	0.48
Chloroform	F3-M307.91-I	<30	<30	---	---
Vinyl chloride	F3-M307.91-I	380	383	382	0.39
m+p-xylenes	F3-M307.91-I	12400	12300	12400	0.40
o-xylene	F3-M307.91-I	4520	4480	4500	0.44



QUALITY ASSURANCE SUMMARY
(Repeat Analyses)
(continued)

	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
<u>Sulfur Components</u>		(Concentration in ppmv)			
Hydrogen sulfide	F3-M307.91-I	23.7	22.9	23.3	1.7
Carbonyl sulfide	F3-M307.91-I	0.16	0.18	0.17	5.9
Methyl mercaptan	F3-M307.91-I	3.38	3.64	3.51	3.7
Ethyl mercaptan	F3-M307.91-I	<0.1	<0.1	---	---
Dimethyl sulfide	F3-M307.91-I	6.53	6.80	6.66	2.0
Carbon disulfide	F3-M307.91-I	0.087	0.095	0.091	4.4
iso-propyl mercaptan	F3-M307.91-I	0.16	0.17	0.16	3.0
n-propyl mercaptan	F3-M307.91-I	<0.06	<0.06	---	---
Dimethyl disulfide	F3-M307.91-I	0.52	0.48	0.50	4.0

One Tedlar bag sample, laboratory number 01115-29, was analyzed for SCAQMD Rule 1150.1 components, hydrogen sulfide, and total reduced sulfur compounds. Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 20 repeat measurements from the one Tedlar bag sample is 1.5%.





AtmAA Inc.

23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

LABORATORY ANALYSIS REPORT

environmental consultants
laboratory services

SCAQMD Rule 1150.1 Components Analysis in Outlet Tedlar Bag Sample

Report Date: May 2, 2005
Client: Horizon / WMNA
Project Location: Bradley LF #3 Flare
Client Project No.: W07-042
Date Received: April 21, 2005
Date Analyzed: April 21, 2005

AtmAA Lab No.: 01115-30
Sample I.D.: W07042
F3-VOC-O
(Concentration in ppbv)

Components

Hydrogen sulfide	<500
Benzene	2.26
Benzylchloride	<0.8
Chlorobenzene	<0.3
Dichlorobenzenes*	<1.1
1,1-dichloroethane	<0.3
1,2-dichloroethane	<0.3
1,1-dichloroethylene	<0.3
Dichloromethane	1.28
1,2-dibromoethane	<0.3
Perchloroethylene	<0.2
Carbon tetrachloride	<0.2
Toluene	0.37
1,1,1-trichloroethane	<0.2
Trichloroethene	<0.2
Chloroform	<0.2
Vinyl chloride	<0.3
m+p-xylenes	0.36
o-xylene	<0.3

* total amount containing meta, para, and ortho isomers

Michael L. Porter
Laboratory Director

CHAIN OF CUSTODY RECORD

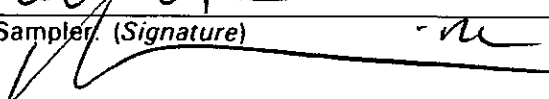
Client/Project Name <i>Waste Management - Bradley Road</i>			Project Location <i>Phase #3 San Valley, CA</i>		
Project No. <i>W07-042</i>			Field Logbook No.		
Sampler: (Signature) <i>[Signature]</i>			Chain of Custody Tape No.		

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	ANALYSES						REMARKS	
					<i>Total Reduced Sulfide (Method 25.1)</i>	<i>Speciated VOCs (Method 25.1)</i>	<i>TRAP #</i>	<i>O₂</i>	<i>Chloride TCA (Method 25.1)</i>	<i>Chloride TBA (Method 25.3)</i>	<i>PCB</i>	
<i>W07042-P3-M30791-I</i>	<i>5/2/05</i>		<i>-29</i>	<i>Tedlar Bag</i>	✓	✓						<i>Inlet</i>
<i>W07042-P3-VOCs - 0</i>			<i>-30</i>	<i>" "</i>	✓							<i>Outlet</i>
<i>Summit S2</i>			<i>-31</i>	<i>Method 25.3</i>			<i>H4</i>		✓	<i>25</i>		<i>Outlet</i>
<i>312</i>			<i>-32</i>	<i>" "</i>			<i>H5</i>		✓	<i>25</i>		<i>"</i>
<i>TANK C</i>			<i>-33</i>	<i>Method 25.1</i>			<i>N</i>	✓	✓	<i>25</i>		<i>inlet</i>
<i>I</i>			<i>-34</i>	<i>" "</i>			<i>DF-3</i>	✓	✓	<i>25</i>		<i>"</i>
							<i>H88</i>		✓			<i>Blank Water</i>

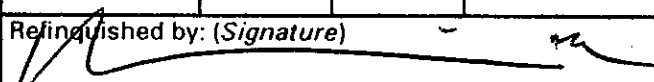
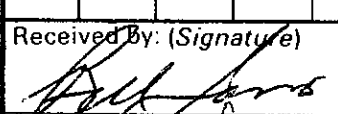
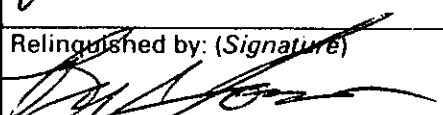
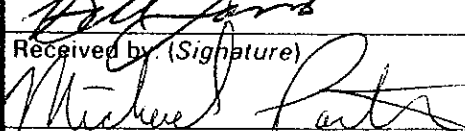
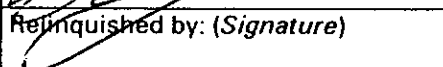
Relinquished by: (Signature) <i>[Signature]</i>		Date <i>4/2/05</i>	Time <i>13:10</i>	Received by: (Signature) <i>[Signature]</i>		Date	Time
Relinquished by: (Signature)		Date	Time	Received by: (Signature)		Date	Time
Relinquished by: (Signature)		Date	Time	Received for Laboratory: (Signature) <i>[Signature]</i>		Date <i>4/2/05</i>	Time <i>13:10</i>
Sample Disposal Method:		Disposed of by: (Signature) <i>[Signature]</i>				Date	Time

SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES, INC 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781 Fax (805) 498-3173	ANALYTICAL LABORATORY <div style="text-align: right; font-size: 1.5em; font-weight: bold;">Nº 8641</div>
--	--

CHAIN OF CUSTODY RECORD

Client/Project Name WASTE ANALYSIS / Broadway CT			Project Location San Valley, CA			ANALYSES					
Project No. 007-042			Field Logbook No.								
Sampler (Signature) 			Chain of Custody Tape No.								

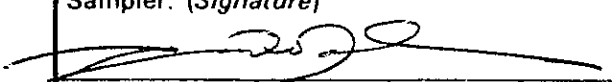
Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	SCPMMS 20.1 (TCL)	Or	Temp	Pi	REMARKS		
TANK K	4/23/05		01155-9		X	X	K	2.5			
J			-10		X	X	T	2.5			

Relinquished by: (Signature) 	Date 4/25/05	Time 1010	Received by: (Signature) 	Date 4/25/05	Time 1010
Relinquished by: (Signature) 	Date 4/25/05	Time 1100	Received by: (Signature) 	Date 4/25/05	Time 1010
Relinquished by: (Signature) 	Date	Time	Received for Laboratory: (Signature)	Date	Time


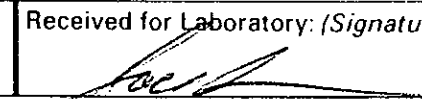
Sample Disposal Method:	Disposed of by: (Signature)	Date	Time

SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES, INC 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781 Fax (805) 498-3173	ANALYTICAL LABORATORY <div style="border: 1px solid black; height: 100px; width: 100%;"></div>	Nº 8213
--	--	----------------

CHAIN OF CUSTODY RECORD

Client/Project Name WASTE MANAGEMENT			Project Location			<div style="display: flex; justify-content: space-around;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">ANALYSES</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">CO₂</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">TRAP</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">TANK</div> </div>					
Project No. W07-042			Field Logbook No.								
Sampler: (Signature) 			Chain of Custody Tape No.								

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	✓	—	Q	S	R	U	T	K	J	REMARKS
17	04-27-05			SCAQMD 25.3	✓									System Blank
25					✓		Q	S						
26					✓		R	R						
5					✓		G	U						
4					✓		U	T						
21					✓		K	K						
28					✓		H	J						

Relinquished by: (Signature) 			Date 04-27-05	Time 1100	Received by: (Signature)			Date	Time
Relinquished by: (Signature)			Date	Time	Received by: (Signature)			Date	Time
Relinquished by: (Signature)			Date	Time	Received for Laboratory: (Signature) 			Date 4-27-05	Time 10145
Sample Disposal Method:			Disposed of by: (Signature)			Date			Time

SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES, INC 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781 Fax (805) 498-3173	ANALYTICAL LABORATORY ATM. A. A. Calabasas CA	Nº 8708
--	--	----------------

APPENDIX D - Field Data Sheets

D₁ upstream: 2.4
D₁ downstream: 4.8
Stack Diameter: 10

Leak Check

Initial: Final:

Run #: 2

Point #	Position in.	Velocity Head in. H ₂ O	Stack Temp °F	Cyclonic Flow Angle
A-8		0.80	129	
7		0.80	129	
6		0.80	129	
5		0.80	130	
4		0.80	130	
3		0.80	129	
2		0.80	130	
1		0.80	129	
Average		$\Delta P = 0.8914$	$T_s = 129$	$L =$

Side View

Top View

PLANT Bradley LF
DATE 4/2/05
LOCATION Sun Valley, CA
OPERATOR me
SOURCE LF Flare #3 En.
VNO. 1-4 AQUAS meter L-1
SAMPLE BOX NO. C-10

METER BOX NO. 5
METER ΔH @ 1.6449
Y= 1.0110
PROBE I.D. NO. N/A
NOZZLE DIAMETER, in. N/A
STACK DIAMETER, in. N/A
PROBE HEATER SETTING N/A
HEATER BOX SETTING N/A
 ΔC_p FACTOR N/A
FILTER NO. N/A

ASSUMED MOISTURE, % 12
 AMBIENT TEMPERATURE 70
 BARO. PRESS. 29.07
 STATIC PRESS. N/A
 NOMAGRAPH INDEX N/A

METER 40.00 @ 10 in. Hg
PITOTS _____ @ _____ in. Hg
ORSAT _____

[illegible]

TIME END = 1010

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	5
Final	150	90	1		241
Initial	100	100	0		260
Liquid Collected	50	10	1		17
Total Vol. Collected					38

Meter 6000 @ 5 in. Hg
Pitots _____ @ _____ in. Hg
Orsat _____

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					
Nozzle Cal	D ₁	D ₂	D ₃	Average	

PLANT Beadley LF
DATE 4/21/06
LOCATION Sun Valley, CA
OPERATOR LC
SOURCE MW#3 Osh
VNO. 2 - SAMS meth 1.
SAMPLE BOX NO. C9

METER BOX NO. 6
METER ΔH @ 1.6445
Y= 1010
PROBE I.D. NO. NA
NOZZLE DIAMETER, in. NA
STACK DIAMETER, in. NA
PROBE HEATER SETTING NA
HEATER BOX SETTING NA
Δ Cp FACTOR NA
FILTER NO. NA

ASSUMED MOISTURE, % NA
 AMBIENT TEMPERATURE NA
 BARO. PRESS. 29.07
 STATIC PRESS. NA
 NOMAGRAPH INDEX NA

TIME START 142

PRE TEST LEAK CHECKS
 METER 40.00 @ 10 in. Hg
 PITOTS _____ @ _____ in. Hg
 ORSAT _____

[illegible]

TIME END = 1112

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	5
Final	120	114	8		276
Initial	100	100	0		256
Liquid Collected	20	14	8		18
Total Vol. Collected					60

POST TEST LEAK CHECKS

Meter 20.00 @ 10 in. Hg
Pitots _____ @ _____ in. Hg
Orsat _____

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					

Nozzle Cal	D ₁	D ₂	D ₃	Average

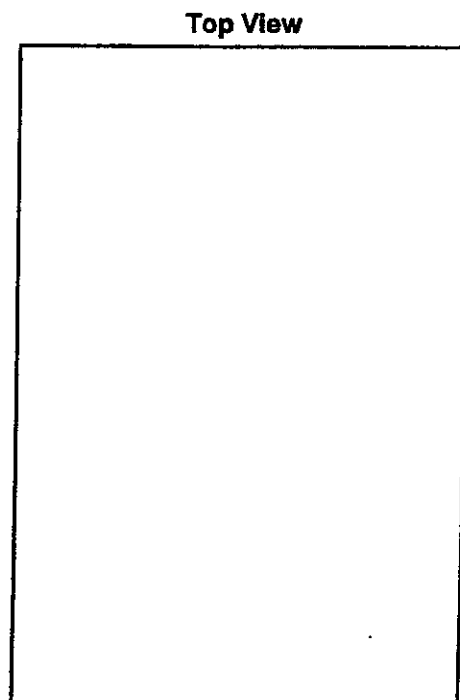
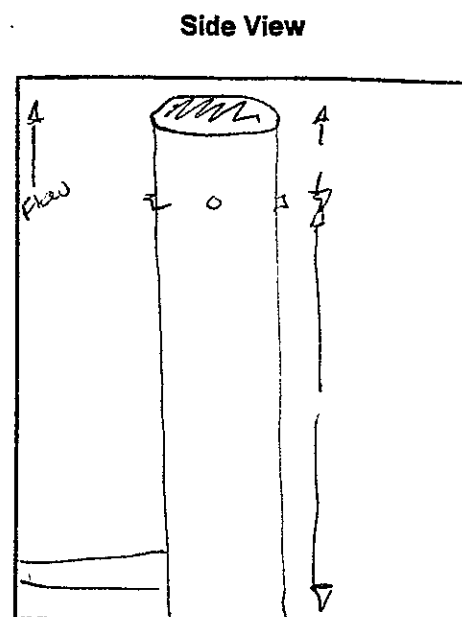
Facility: Bradley LF
 Source: Flare # 3
 Job #: W07-042
 Date: 4/21/05
 Operator: RC

Baro. Press: 29.012
 Static Press: -0.005
 Pitot Tube #: Inco 10'
 Pitot Tube Type: 45"
 Magnahelic: Manometer

D₁ upstream: _____
 D₁ downstream: _____
 Stack Diameter: _____
 Leak Check
 Initial: / Final: /

Run #: Prelim

Point #	Position in.	Velocity Head in. H ₂ O	Stack Temp °F	Cyclonic Flow Angle
A-12		<0.010	1580	
11		<0.01	1611	
10		<0.01	1658	
9		<0.01	1704	
8		<0.01	1688	
7		<0.01	1644	
6		<0.01	1686	
5		<0.01	1648	
4		<0.01	1632	
3		<0.01	1644	
2		<0.01	1611	
1		<0.01	1594	
B-12		<0.01	1642	
11		<0.01	1630	
10		<0.01	1684	
9		<0.01	1701	
8		<0.01	1684	
7		<0.01	1671	
6		<0.01	1666	
5		<0.01	1654	
4		<0.01	1643	
3		<0.01	1624	
2		<0.01	1611	
1		<0.01	1620	
Average		√ΔP=	T _s =	∠=



PARTICULATE FIELD DATA

PLANT Bradley LF
 DATE 4/21/05
 LOCATION Valley, CA
 OPERATOR W. J. ...
 SOURCE LEA Marc #3
 N NO. 1-540 mg methus
 SAMPLE BOX NO. C-3

METER BOX NO. 7
 METER ΔH @ 1.5261
 $Y =$ 1.0015
 PROBE I.D. NO. 10' Incon-6
 NOZZLE DIAMETER, in. 1.02 (CO)
 STACK DIAMETER, in. 46"
 PROBE HEATER SETTING NA
 HEATER BOX SETTING NA
 ΔC_p FACTOR 0.84
 FILTER NO. C5003

ASSUMED MOISTURE, % 10
 AMBIENT TEMPERATURE ~70°F
 BARO. PRESS. 29.07
 STATIC PRESS. -0.005
 NOMOGRAPH INDEX 210 220

TIME START 0910

PRE TEST LEAK CHECKS
 METER 0.001 @ 13 in. Hg
 PITOTS 1/2 @ 73/25 in. Hg
 ORSAT

PH	TIME	T _g °F	ΔP in H ₂ O	$\sqrt{\Delta P}$	ΔH in H ₂ O	V _m ft ³	T _{m IN} °F	T _{m OUT} °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A-12	00	1664	0.01		2.2	978.482	89	88	NA	75	7
11	2.5	1659	0.01		2.2	980.9	86	88		61	7
10	5.0	1669	0.01		2.2	983.1	87	88		58	7
9	7.5	1655	0.01		2.2	985.3	90	88		57	7
8	10.0	1662	0.01		2.2	987.4	90	88		56	7
7	12.5	1631	0.01		2.2	989.6	92	88		57	7
6	15.0	1639	0.01		2.2	991.8	94	88		57	7
5	17.5	1645	0.01		2.2	994.0	95	88		58	7
4	20.0	1652	0.01		2.2	996.2	95	88		58	7
3	22.5	1656	0.01		2.2	998.4	96	89		58	7
2	25.0	1661	0.01		2.2	1000.7	97	89		57	7
1	27.5	1655	0.01		2.2	1002.9	98	89		58	7
B-12	30.0	1647	0.01		2.2	1005.32	910	911		59	7
11	32.5	1641	0.01		2.2	1007.0	95	90		57	7
10	35.0	1639	0.01		2.2	1009.2	98	91		56	7
9	37.5	1631	0.01		2.2	1011.5	98	92		56	7
8	40.0	1646	0.01		2.2	1013.8	100	93		57	7
7	42.5	1633	0.01		2.2	1016.0	100	93		57	7
6	45.0	1643	0.01		2.2	1018.2	100	94		56	7
5	47.5	1642	0.01		2.2	1020.4	100	94		55	7
4	50.0	1640	0.01		2.2	1022.6	100	95		56	7
3	52.5	1645	0.01		2.2	1024.9	100	94		55	7
2	55.0	1641	0.01		2.2	1027.0	101	94		56	7
1	57.5	1629	0.01		2.2	1029.3	101	96		56	7
	60.0					1031.54					
Avg.		1648.1		0.1000	2.2	53.032		93.1			

TIME END = 1025

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	
Final	216	121	5		274
Initial	100	100	0		261
Liquid Collected	116	21	5		13
Total Vol. Collected					155

POST TEST LEAK CHECKS
 Meter 0.001 @ 13 in. Hg
 Pitots 1/2 @ 73/25 in. Hg
 Orsat

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					
Nozzle Cal	D ₁	D ₂	D ₃	Average	

PARTICULATE FIELD DATA

PLANT Burbank LF
 DATE 4/21/05
 LOCATION 30m Valley, CA
 OPERATOR PC (tw)
 SOURCE 4th Floor 23 CTR
 VNO 2-5 Aqueduct Meth S
 METER BOX NO. _____

TIME START 1112

METER BOX NO. 7
 METER ΔH @ 1.5261
 Y= 1.0015
 PROBE I.D. NO. Emco, 101
 NOZZLE DIAMETER, in. 1.02
 STACK DIAMETER, in. 96"
 PROBE HEATER SETTING NA
 HEATER BOX SETTING NA
 ΔC_p FACTOR 0.80
 FILTER NO. _____

ASSUMED MOISTURE, % 10
 AMBIENT TEMPERATURE 72.50F
 BARO. PRESS. 29.07
 STATIC PRESS. -0.005
 NOMOGRAPH INDEX 220

PRE TEST LEAK CHECKS
 METER 50.001 @ 10 in. Hg
 PITOTS 1/3 @ 23/23 in. Hg
 ORSAT _____

P#	TIME	T _s °F	ΔP in H ₂ O	$\sqrt{\Delta P}$	ΔH in H ₂ O	V _m ft ³	T _{m IN} °F	T _{m OUT} °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A-12	00	1576	0.01		2.2	034.563	96	96	NA	90	6
11	2.5	1590	0.01		2.2	036.9	96	96		64	6
10	5.0	1656	0.01		2.2	039.2	98	96		60	6
9	7.5	1632	0.01		2.2	041.5	101	96		58	6
8	10.0	1516	0.01		2.2	043.8	103	97		57	6
7	12.5	1605	0.01		2.2	046.1	103	97		56	6
6	15.0	1633	0.01		2.2	048.4	104	97		55	6
5	17.5	1625	0.01		2.2	050.6	104	98		56	6
4	20.0	1638	0.01		2.2	052.9	104	98		55	6
3	22.5	1610	0.01		2.2	055.1	104	100		56	6
2	25.0	1612	0.01		2.2	057.5	105	98		57	6
1	27.5	1611	0.01		2.2	059.7	105	98		56	6
B-12	30.0	1636	0.01		2.2	062.056	99	99		57	6
11	32.5	1626	0.01		2.2	064.3	100	100		56	6
10	35.0	1633	0.01		2.2	066.5	101	99		57	6
9	37.5	1648	0.01		2.2	068.7	104	99		56	6
8	40.0	1598	0.01		2.2	071.0	104	99		56	6
7	42.5	1608	0.01		2.2	073.3	105	99		57	6
6	45.0	1651	0.01		2.2	075.6	106	99		56	6
5	47.5	1648	0.01		2.2	077.8	107	99		57	6
4	50.0	1600	0.01		2.2	080.2	107	99		58	6
3	52.5	1593	0.01		2.2	082.4	107	100		56	6
2	55.0	1632	0.01		2.2	084.7	107	100		57	6
1	57.5	1654	0.01		2.2	087.0	107	100			
	60.0					089.244					
Avg.		1621.3			2.2	54.681		100.8			

TIME END = 1720

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght
	1	2	3	4	
Final	242	110	2		269
Initial	100	100	0		261
Liquid Collected	142	10	2		8
Total Vol. Collected					162

POST TEST LEAK CHECKS
 Meter 40.001 @ 10 in. Hg
 Pitots 1/3 @ 23/23 in. Hg
 ORSAT _____

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					
Nozzle Cal	D ₁	D ₂	D ₃	Average	

**TOTAL COMBUSTION ANALYSIS
SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET**

Job #: W07-042
Facility: Bradley L.F.
Location: bin Valley
Date: 4/24/05
Operator: TW

Control Device: Flare #3
Sample Location: Outlet
Ambient Temp.: 72°F
Baro. Pressure: 29.09

SAMPLE A

Tank #: 52 Trap #: H4
Initial Vacuum: 30" 2.5 torr
Final Vacuum: 9"
Start Time: 0910

SAMPLE B

Tank #: 312 Trap #: H5
Initial Vacuum: 30" / 2.5 torr
Final Vacuum: 8
End Time: 0955

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	
05	28.5	
10	27	
15	25.5	
20	24	
25	22.5	
30	21	
35	19	
40	17	
45	15	
50	13	
55	11	
60	9	

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	
05	28	
10	26.5	
15	25	
20	23.5	
25	¹⁰ 22 22	
30	20	
35	18	
40	16	
45	14	
50	12	
55	10	
60	8	

LEAK RATE

Pre Test : ✓✓
Post Test: ✓✓

**TOTAL COMBUSTION ANALYSIS
SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET**

Job #: W07-042
Facility: Bradley LC
Location: Son Valley, CA
Date: 4/23/05
Operator: ML

Control Device: LFG Hvac #3
Sample Location: Inlet
Ambient Temp.: 68.9 F
Baro. Pressure: 29.10

SAMPLE A

Tank #: K Trap #: K
Initial Vacuum: 2.5
Final Vacuum: _____
Start Time: 1258

SAMPLE B

Tank #: J Trap #: H
Initial Vacuum: 2.5
Final Vacuum: _____
End Time: _____

TIME (min.)	VACUUM (Hg)	FLOW (cc/min)
00	29	100
05	28	100
10	27	100
15	26	100
20	25	100
25	24	100
30	23	100
35	22	100
40	21	100
45	20	100
50	19	100
55	18	
60	17	

TIME (min.)	VACUUM (Hg)	FLOW (cc/min)
00	29	100
05	28	100
10	27	100
15	26	100
20	25	100
25	24	100
30	23	100
35	22	100
40	21	100
45	20	100
50	19	100
55	18	100
60	17	

LEAK RATE

Pre Test: ✓/✓
Post Test: ✓/✓

APPENDIX E - Calibration Information

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (525) 585-2154
Facsimile: (714) 642-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR

P.O NUMBER

REFERENCE STANDARD

COMPONENT
NITRIC OXIDE

NIST SRM NO.
VS. SRM#2629

CYLINDER NO.
CC 145830

CONCENTRATION
24.78 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

1. COMPONENT NITRIC OXIDE		ANALYZER MAKE-MODEL-S/N		Thermo Env. 42H S/N 42H-44979-273	
ANALYTICAL PRINCIPLE		CHEMILUMINESCENCE		LAST CALIBRATION DATE	
FIRST ANALYSIS DATE		12/30/04		01/02/05	
Z 0.1	R 24.0	C 12.5	CONC. 12.9	Z -0.1	R 24.8
R 24.3	Z 0.1	C 12.7	CONC. 12.9	R 24.9	Z -0.1
Z 0.1	C 12.7	R 24.4	CONC. 12.8	Z 0.0	C 12.6
U/M ppm		MEAN TEST ASSAY	12.9	U/M ppm	
					MEAN TEST ASSAY 12.7

VALUE NOT VALID BELOW 150 PSIG. NOx VALUE FOR REFERENCE ONLY.

THIS CYLINDER NO. SA 16697
HAS BEEN CERTIFIED ACCORDING TO SECTION
OF TRACEABILITY PROTOCOL NO. EPA-600/R97/121
PROCEDURE G1 REV. 9/97
CERTIFIED ACCURACY ± 1 % NIST TRACEABLE
CYLINDER PRESSURE 2000 PSIG
CERTIFICATION DATE 01/06/05
EXPIRATION DATE 01/06/07 TERM 24 MONTHS

CERTIFIED CONCENTRATION
NITRIC OXIDE 12.8 ppm
NITROGEN BALANCE
NOx 13.0 ppm

ANALYZED BY

Phil Kim
PHIL KIM

CERTIFIED BY

Joseph Charles
JOSEPH CHARLES

IMPORTANT

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

064

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (525) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR

P.O NUMBER

REFERENCE STANDARD

COMPONENT
NITRIC OXIDE

NIST SRM NO.
vs. SRM#2629

CYLINDER NO.
CC 144870

CONCENTRATION
24.81 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

1. COMPONENT NITRIC OXIDE

ANALYZER MAKE-MODEL-S/N

Thermo Env. 42H S/N 42H-44979-273

ANALYTICAL PRINCIPLE

CHEMILUMINESCENCE

LAST CALIBRATION DATE

11/02/04

FIRST ANALYSIS DATE

11/02/04

SECOND ANALYSIS DATE

11/09/04

Z 0.0 R 24.1

C 18.8 CONC. 19.4

Z 0.1 R 24.0

C 18.8 CONC. 19.4

R 24.1 Z 0.0

C 18.8 CONC. 19.4

R 24.0 Z 0.1

C 18.9 CONC. 19.5

Z 0.0 C 18.8

R 24.1 CONC. 19.4

Z 0.1 C 18.9

R 24.0 CONC. 19.5

U/M ppm

MEAN TEST ASSAY 19.4

U/M ppm

MEAN TEST ASSAY 19.5

VALUE NOT VALID BELOW 150 PSIG. NOx VALUE FOR REFERENCE ONLY.
LAST ANALYSIS: NO=20.2 ppm 9/20/02

THIS CYLINDER NO. CC 150203

HAS BEEN CERTIFIED ACCORDING TO SECTION

EPA-600/R97/121

CERTIFIED CONCENTRATION

OF TRACEABILITY PROTOCOL NO.

REV. 9/97

NITRIC OXIDE

19.4 ppm

PROCEDURE G1

NITROGEN

BALANCE

CERTIFIED ACCURACY ± 1 % NIST TRACEABLE

NOx

20.0 ppm

CYLINDER PRESSURE 1000 PSIG

CERTIFICATION DATE 11/09/04

EXPIRATION DATE 11/09/06 TERM 24 MONTHS

ANALYZED BY

JOSEPH CHARLES

CERTIFIED BY

PHIL KIM

IMPORTANT

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

065



Praxair Distribution, Inc.
5700 S. Alameda Street
Los Angeles, CA 90058
Tel: 323-585-2154
Fax: 714-542-6689

6/9/04

Horizon Air
996 LAWRENCE DR STE 108
NEWBURY PARK, CA 91320
USA

Attention: HORIZON AIR MEASUREMENTS

Praxair Order No. **953055-00**
Customer Reference No.

Product Lot/Batch No. **109326903**
Praxair Part No. **EV NINX19MP-AS**

CERTIFICATE OF ANALYSIS

Primary Standard

<u>Component</u>	<u>Requested Concentration</u>	<u>Certified Concentration</u>	<u>Analytical Principle</u>	<u>Analytical Accuracy</u>
Nitrogen dioxide (AS NOX)	19 ppm	18.5 ppm	A	±1 %
Nitrogen		balance		

Analytical Instruments: **Thermo Environmental-42H-Chemiluminescence-Other**
Cylinder Style: **AS** Filling Method: **Gravimetric**
Cylinder Pressure @70F: **1700 psig** Date of Fill: **9/25/03**
Cylinder Volume: **122 ft3** Expiration Date: **6/8/06**
Valve Outlet Connection: **660**
Cylinder No(s): **CC 149665**
Comments: **NO=0.5 ppm VALUE IS FOR REFERENCE ONLY.**

Analyst: 
Joseph Charles

QA Reviewer: 
Phu Tien Nguyen

The gas calibration cylinder standard prepared by Praxair Distribution is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Reference Materials which are either prepared by weights traceable to the National Institute of Standards and Technology (NIST) or by using NIST Standard Reference Materials where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by volume (e.g., ppmv) unless otherwise noted.

Key to Analytical Techniques:

A Chemiluminescence	B Gravimetric	C Electrolytic Cell	D Photolization HNU
E Pulsed Fluorescence	F Ultra Violet Spectrometry		

IMPORTANT

The information contained herein has been prepared at your request by personnel within Praxair Distribution. While we believe the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall liability of Praxair Distribution, Inc. arising out of the use of the information contained herein exceed the fee established for providing such information.

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS

P.O NUMBER 8565

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE GMIS	VS.SRM#1678	CC 160092	51.1 ppm
NITRIC OXIDE GMIS	1683b	SA 7757	49.7 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

1. COMPONENT CARBON MONOXIDE GMIS		ANALYZER MAKE-MODEL-S/N		Siemens Ultramat 5E S/N A12-729	
ANALYTICAL PRINCIPLE NDIR				LAST CALIBRATION DATE 03/19/05	
FIRST ANALYSIS DATE 02/20/05				SECOND ANALYSIS DATE 03/28/05	
Z 0.0	R 51.1	C 50.6	CONC. 50.6	Z 0.0	R 51.1
R 51.1	Z 0.0	C 50.7	CONC. 50.7	R 51.2	Z 0.0
Z 0.0	C 50.6	R 51.1	CONC. 50.6	Z 0.0	C 51.0
U/M ppm	MEAN TEST ASSAY 50.6 ppm	U/M ppm	MEAN TEST ASSAY 50.9 ppm		
2. COMPONENT NITRIC OXIDE GMIS		ANALYZER MAKE-MODEL-S/N		BECKMAN 951A S/N#0101354	
ANALYTICAL PRINCIPLE CHEMILUMINESCENCE				LAST CALIBRATION DATE 03/01/05	
FIRST ANALYSIS DATE 02/20/05				SECOND ANALYSIS DATE 03/28/05	
Z 0.0	R 479.6	C 486.3	CONC. 50.4	Z 0.0	R 471.0
R 479.1	Z 0.0	C 486.3	CONC. 50.4	R 470.4	Z 0.0
Z 0.0	C 486.6	R 478.6	CONC. 50.5	Z 0.0	C 478.6
U/M mV	MEAN TEST ASSAY 50.4 ppm	U/M mV	MEAN TEST ASSAY 50.5 ppm		

NOx value solely for reference use. Values not valid below 150 psig.

THIS CYLINDER NO.	CC 110519	CERTIFIED CONCENTRATION	
HAS BEEN CERTIFIED ACCORDING TO SECTION	EPA-600/R97/121	CARBON MONOXIDE	50.8 ppm
OF TRACEABILITY PROTOCOL NO.	Rev. 9/97	NITRIC OXIDE	50.4 ppm
PROCEDURE	G1	NITROGEN	BALANCE
CERTIFIED ACCURACY	± 1 % NIST TRACEABLE	NOx	51.1 ppm
CYLINDER PRESSURE	2000 PSIG		
CERTIFICATION DATE	03/28/05		
EXPIRATION DATE	03/28/07	TERM	24 MONTHS

ANALYZED BY

CHRIS VU

CERTIFIED BY

MICHAEL TSANG

IMPORTANT

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS

P.O NUMBER 8488

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE GMIS	vs SRM#1684b	CC 136077	99.1 ppm
CARBON MONOXIDE GMIS	vs. SRM#1679	CC 160064	101.3 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

1. COMPONENT	NITRIC OXIDE	GMIS	ANALYZER MAKE-MODEL-S/N	BECKMAN 951A	S/N#0101354
ANALYTICAL PRINCIPLE	CHEMILUMINESCENCE		LAST CALIBRATION DATE	11/01/04	
FIRST ANALYSIS DATE	11/24/04		SECOND ANALYSIS DATE		
Z 0.0	R 948.0	C 766.8	CONC.	80.2	Z R C CONC.
R 947.2	Z 0.0	C 765.9	CONC.	80.1	R Z C CONC.
Z 0.0	C 767.2	R 948.0	CONC.	80.2	Z C R CONC.
U/M mV	MEAN TEST ASSAY		80.2	U/M mV	MEAN TEST ASSAY
2. COMPONENT	CARBON MONOXIDE	GMIS	ANALYZER MAKE-MODEL-S/N	HORIBA, VIA-510,	S/N 576876015
ANALYTICAL PRINCIPLE	NDIR		LAST CALIBRATION DATE	11/02/04	
FIRST ANALYSIS DATE	11/24/04		SECOND ANALYSIS DATE		
Z 0.0	R 101.3	C 80.1	CONC.	80.1	Z R C CONC.
R 101.3	Z 0.0	C 80.0	CONC.	80.0	R Z C CONC.
Z 0.0	C 80.1	R 101.3	CONC.	80.1	Z C R CONC.
U/M ppm	MEAN TEST ASSAY		80.1	U/M ppm	MEAN TEST ASSAY

VALUES NOT VALID BELOW 150 PSIG

LAST ASSAY DATE AND RESULTS: 11/23/02, 81.0 ppm NO, 80.4 ppm CO,
81.1 ppm NOx.

THIS CYLINDER NO. CC 138486
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. REV 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 % NIST TRACEABLE
CYLINDER PRESSURE 1500 PSIG
CERTIFICATION DATE 11/24/04
EXPIRATION DATE 11/24/06 TERM 24 MONTHS

CERTIFIED CONCENTRATION
NITRIC OXIDE 80.6 ppm
CARBON MONOXIDE 80.2 ppm
NITROGEN BALANCE
NOx 81.0 ppm

ANALYZED BY

MICHAEL TSANG

CERTIFIED BY

CHRIS VU

IMPORTANT

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

3/10/05

Horizon Air
996 Lawrence Dr Ste 108
Newbury Park, CA
USA 91320

Attention: Deborah Vacherst

Praxair Order No. **43172600**
Customer Reference No.

Product Lot/Batch No. **109434618**
Praxair Part No. **EV NICDOXP1-AS**

CERTIFICATE OF ANALYSIS

Primary Standard

Component	Requested Concentration	Certified Concentration	Analytical Principle	Analytical Accuracy
Carbon dioxide	7 %	6.99 %	V	±0.02 % abs.
Oxygen	12 %	12.05 %		±0.02 % abs.
Nitrogen	balance	balance		

Analytical Instruments: **Mettler-ID5-Gravimetric**
Cylinder Style: **AS**
Cylinder Pressure @70F: **2000 psig**
Cylinder Volume: **148 ft3**
Valve Outlet Connection: **590**
Cylinder No(s): **CC 144975**

Filling Method: **Gravimetric**
Date of Fill: **12/11/04**
Expiration Date: **3/9/08**

Analyst: **Jack Fu**

QA Reviewer: **Ty Triplett**

The gas calibration cylinder standard prepared by Praxair Distribution is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Reference Materials which are either prepared by weights traceable to the National Institute of Standards and Technology (NIST) or by using NIST Standard Reference Materials where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by volume (e.g., ppmv) unless otherwise noted.

Key to Analytical Techniques:

A Flame Ionization with Methanizer	B Gas Chromatography with Discharge Ionization Detector	C Gas Chromatography with Electrolytic Conductivity Detector	D Gas Chromatography with Flame Ionization Detector
E Gas Chromatography with Flame Photometric Detector	F Gas Chromatography with Helium Ionization Detector	G Gas Chromatography with Methanizer Carbonizer	H Gas Chromatography with Photoionization Detector
I Gas Chromatography with Reduction Gas Analyzer	J Gas Chromatography with Thermal Conductivity Detector	K Gas Chromatography with Ultrasonic Detector	L Infrared - FTIR or NDIR
M Mass Spectrometry - MS or GC/MS	N Proprietary	O Paramagnetic	P Specific Water Analyzer
Q Total Hydrocarbon Analyzer	R Wet Chemical	S Detector Tube	T Odor
U Chemiluminescence	V Gravimetric	W Electrolytic Cell/Electrochemical	X Photoionization
Y Pulsed Fluorescence	Z UV Spectrometry		

IMPORTANT

The information contained herein has been prepared at your request by personnel within Praxair Distribution. While we believe the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall liability of Praxair Distribution, Inc. arising out of the use of the information contained herein exceed the fee established for providing such information.

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (525) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS

CUSTOMER HORIZON AIR MEASUREMENTS

DATE 05/12/04

P.O NUMBER

REF. NUMBER 67757400

REQUESTED COMPOSITION

GAS	CONCENTRATION
CARBON DIOXIDE	12 %
OXYGEN	20 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY	±0.02%abs

ANALYTICAL METHOD

INSTRUMENT	ANALYTICAL PRINCIPLE
Mettler ID5, S/N:1865166	Gravimetric
Mettler ID5, S/N:1865166	Gravimetric

Values not valid below 150 psig.

THIS CYLINDER NO.	SA 20202
CYLINDER PRESSURE	2000 PSIG
EXPIRATION DATE	12/31/07
CLASSIFICATION	PRIMARY STANDARD
BATCH NUMBER	N/A
LOT NUMBER	109413306
PART NUMBER	NI CDOXP80-AS
CYLINDER SIZE	AS CGA 590 152 CFT

CERTIFIED CONCENTRATION	
CARBON DIOXIDE	12.01 %
OXYGEN	20.01 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY	±0.02%abs

ANALYZED BY

JACK BU

CERTIFIED BY

TY TRIPLETT

IMPORTANT

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

070

Magnehelic Gauge Calibration Data

Range: 0 - 5.0"

Date: 01/05/2004

Calibrated by: F.Torres

BAROMETRIC PRESURE: 29.12

Reference: 0.0-10.0 Manometer

SYSTEM

LEAK CHECKS (Y/N): Y

POINT

LEAK CHECK (Y/N): Y

Magnehelic Box 3

Serial # R980817MLG44

MAG	MAN R1	MAN R2	MAN R3	MEAN	MEAN/MAG
1.00	1.00	1.00	1.00	1.000	1.000
2.00	2.00	2.00	2.00	2.000	1.000
3.00	3.00	3.00	3.00	3.000	1.000
4.00	4.00	4.00	4.00	4.000	1.000
5.00	5.00	5.00	5.00	5.000	1.000

Correction Factor:

1.0000

Control Box Calibration Data

Date: 01/04/05

Calibrated by: Bill Jones

Meter Box Number: 5

Barometric Pressure: 28.86

Wet Test Meter Cf: 0.9971

Orifice setting (H)	Gas Volumes			Temperatures			Time (min)	Y	H@
	Wet Test (cu.ft)	Dry Gas Initial (cu.ft)	Dry Gas Final (cu.ft)	DGM Initial (°F)	DGM final (°F)	WTM (°F)			
0.5	11.222	522.269	533.248	70	76	72	26	1.0198	1.5746
1.0	11.378	510.809	522.085	71	77	70	19	1.0107	1.6213
1.5	13.744	496.934	510.587	70	77	69	19	1.0084	1.6612
2.0	11.609	485.229	496.707	69	76	69	14	1.0095	1.6896
3.0	11.294	473.941	485.076	67	74	68	11	1.0084	1.6523
4.0	11.828	462.225	473.775	64	71	68	10	1.0094	1.6702
AVERAGE								1.0110	1.6449

Reviewed by:



Control Box Calibration Data

Date: 01/03/05

Calibrated by: Bill Jones

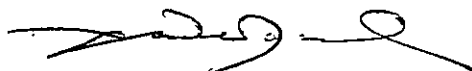
Meter Box Number: 7

Barometric Pressure: 28.94

Wet Test Meter Cf: 0.9971

Orifice setting (H)	Gas Volumes			Temperatures			Time (min)	Y	H@
	Wet Test (cu.ft)	Dry Gas Initial (cu.ft)	Dry Gas Final (cu.ft)	DGM Initial (°F)	DGM final (°F)	WTM (°F)			
0.5	11.017	599.764	610.945	74	76	60	25	1.0091	1.4344
1.0	10.975	588.339	599.496	74	77	60	18	1.0070	1.4972
1.5	11.778	576.038	588.000	71	77	60	16	1.0044	1.5443
2.0	11.830	563.839	575.848	69	75	60	14	0.9998	1.5685
3.0	11.475	551.870	563.440	66	73	60	11	0.9989	1.5518
4.0	12.078	539.424	551.553	58	69	60	10	0.9895	1.5604
AVERAGE								1.0015	1.5261

Reviewed by:



PROBE 10-1

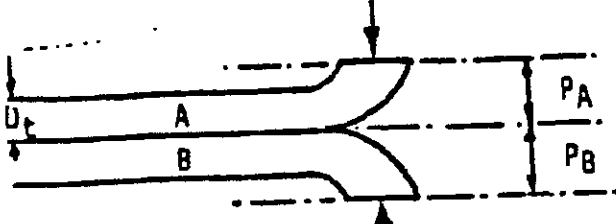
TYPE S PITOT TUBE INSPECTION DATA FORM

Tubing diameter, D_t 0.362 in.

Pitot Tube Assembly Level? Yes 1 No

Pitot Tube Openings Damaged? Yes 1 No

A-SIDE PLANE

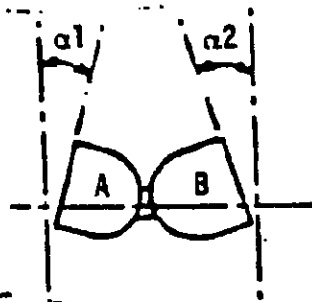


NOTE: 0.986

$$\begin{cases} 1.05 D_t < P < 1.50 D_t \\ P_A = P_B \end{cases}$$

$P_A = \underline{0.493}$ in.

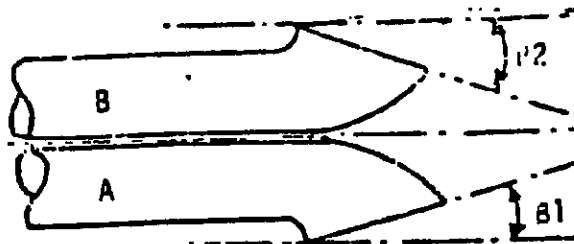
$P_B = \underline{0.493}$ in.



$$\alpha_1 = \underline{2}^\circ$$

$$\alpha_2 = \underline{2}^\circ$$

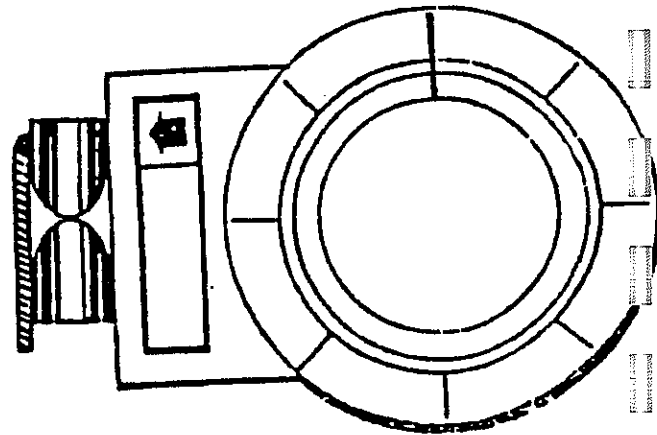
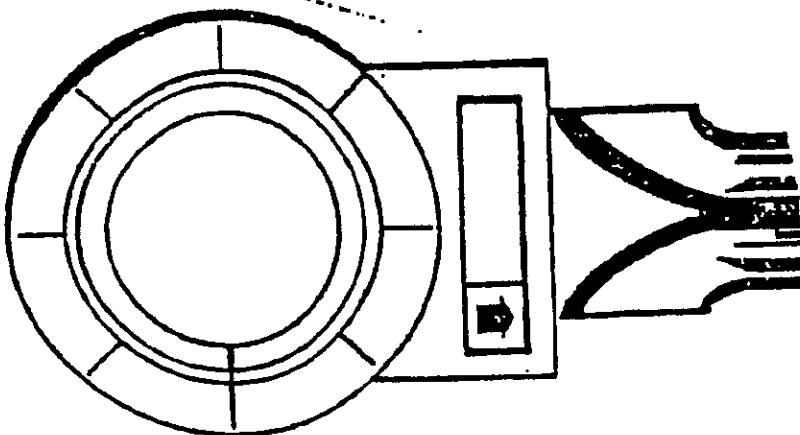
($< 10^\circ$)



$$\beta_1 = \underline{1.0}^\circ$$

$$\beta_2 = \underline{1.0}^\circ$$

($< 5^\circ$)



Level Position to Find $\gamma = \underline{1.5}$

$$Z = A \sin \gamma = \underline{0.026} \text{ in. } (< 1/8 \text{ in.})$$

Level Position to find $\theta = \underline{1.5}$

$$W = A \sin \theta = \underline{0.026} \text{ in. } (< 1/32 \text{ in.})$$

Comments _____

Checked by: [Signature]

Date: 1-6-05

Calibration Required? N/A

STACK TEMPERATURE SENSOR CALIBRATION DATA- APEX PROBE ASSEMBLIES

Date: 01/10/06

Calibrated by: B. Jones

THERMOCOUPLE

ID:

	ICE WATER						ABSOLUTE T DIFF., %			BOILING WATER						ABSOLUTE T DIFF., %			BOILING OIL						ABSOLUTE T DIFF., %		
	REF			TC						REF			TC						REF			TC					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Stainless Steel Probes																											
3-1	32	32	32	30	30	30	0.4	0.4	0.4	212	212	212	211	211	210	0.1	0.1	0.3	536	536	536	534	534	535	0.2	0.2	0.1
4-2	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	210	209	210	0.3	0.4	0.3	535	534	534	535	533	532	0.0	0.1	0.2
4-3	32	32	32	30	31	31	0.4	0.2	0.2	212	212	212	211	210	210	0.1	0.3	0.3	547	548	548	544	545	546	0.3	0.3	0.2
6-2	31	32	32	31	31	30	0.0	0.2	0.4	210	211	211	208	209	210	0.3	0.3	0.0	535	535	535	536	534	534	-0.1	0.1	0.1
6-3	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	210	210	210	0.3	0.3	0.3	535	536	536	536	535	535	-0.1	0.1	0.1
6-4	32	31	32	31	30	30	0.2	0.2	0.4	212	212	212	211	211	211	0.2	0.1	0.1	535	534	538	536	533	535	-0.1	0.1	0.3
A6-5	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	211	211	210	0.1	0.1	0.3	540	539	539	537	537	537	0.3	0.2	0.2
A8-1	32	32	31	31	30	31	0.2	0.4	0.0	212	212	212	211	211	211	0.1	0.1	0.1	536	537	537	536	535	535	0.0	0.2	0.2
A8-2	32	32	32	30	31	31	0.4	0.2	0.2	212	212	212	210	210	210	0.3	0.3	0.3	537	537	535	536	536	533	0.1	0.1	0.2
A8-3	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	211	211	211	0.1	0.1	0.1	550	550	550	549	549	550	0.1	0.1	0.0
10-1	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	211	211	211	0.1	0.1	0.1	536	537	536	533	533	533	0.3	0.4	0.3
M17-2	32	32	32	31	31	30	0.2	0.2	0.4	212	212	212	211	211	211	0.1	0.1	0.1	536	536	535	536	535	533	0.0	0.1	0.2
M17-3	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	210	211	211	0.3	0.1	0.1	534	536	535	533	535	536	0.1	0.1	-0.1
Inconel																											
10-1 Inc	32	32	32	30	31	32	0.4	0.2	0.0	212	212	212	210	211	211	0.3	0.1	0.1	548	548	548	545	548	544	0.3	0.0	0.4
6-1 Inc	32	32	32	30	30	31	0.4	0.4	0.2	212	212	212	211	211	211	0.1	0.1	0.1	550	550	550	548	548	548	0.2	0.2	0.2
Loose Thermocouple																											
6-5	32	32	32	33	30	31	-0.2	0.4	0.2	212	212	212	209	211	210	0.4	0.1	0.3	532	533	533	530	531	530	0.2	0.2	0.3
6-8	32	32	32	30	31	31	0.4	0.2	0.2	212	212	212	210	211	212	0.3	0.1	0.0	548	549	549	545	545	545	0.3	0.4	0.4
7-1	32	32	32	30	30	30	0.4	0.4	0.4	212	212	212	210	210	210	0.3	0.3	0.3	533	534	536	531	533	536	0.2	0.1	0.0
8-3	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	211	211	211	0.1	0.1	0.1	550	550	550	549	549	550	0.1	0.1	0.0

Note: If absolute temperature values of the reference thermometer being calibrated and the stack temperature sensors agree within 1.5 percent at each of the three calibration points, no correction is needed.

075

APPENDIX F - Strip Chart Data

2000/1/10

$\frac{0.7}{0.9} \approx 0.78$

三才圖會

三、

1400 2000 3000 4000 5000 6000 7000 8000 9000 10000

7062

05021
50050

06-07

32

THE

08-06-2007

2020

(open for) 8h-9h

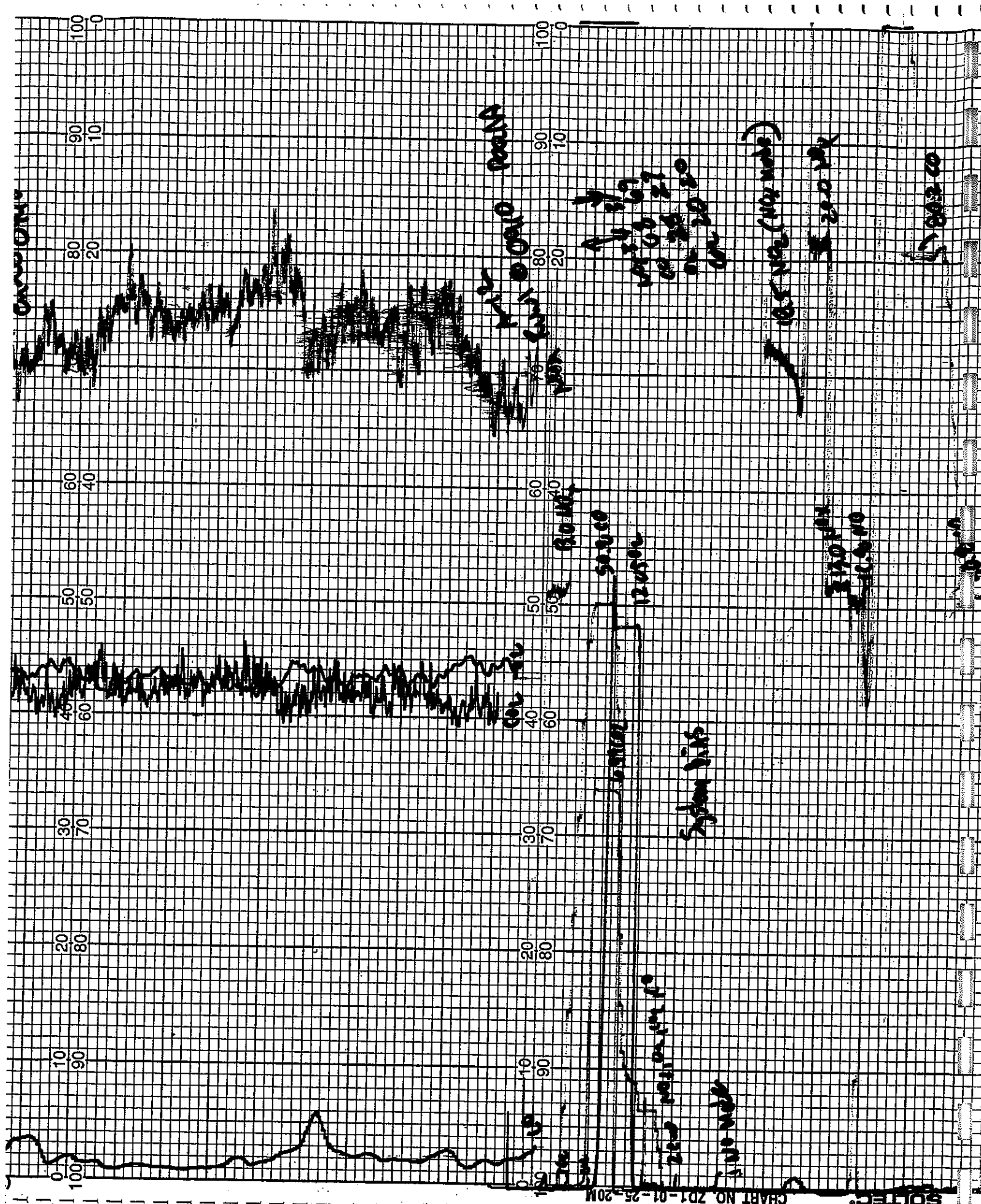
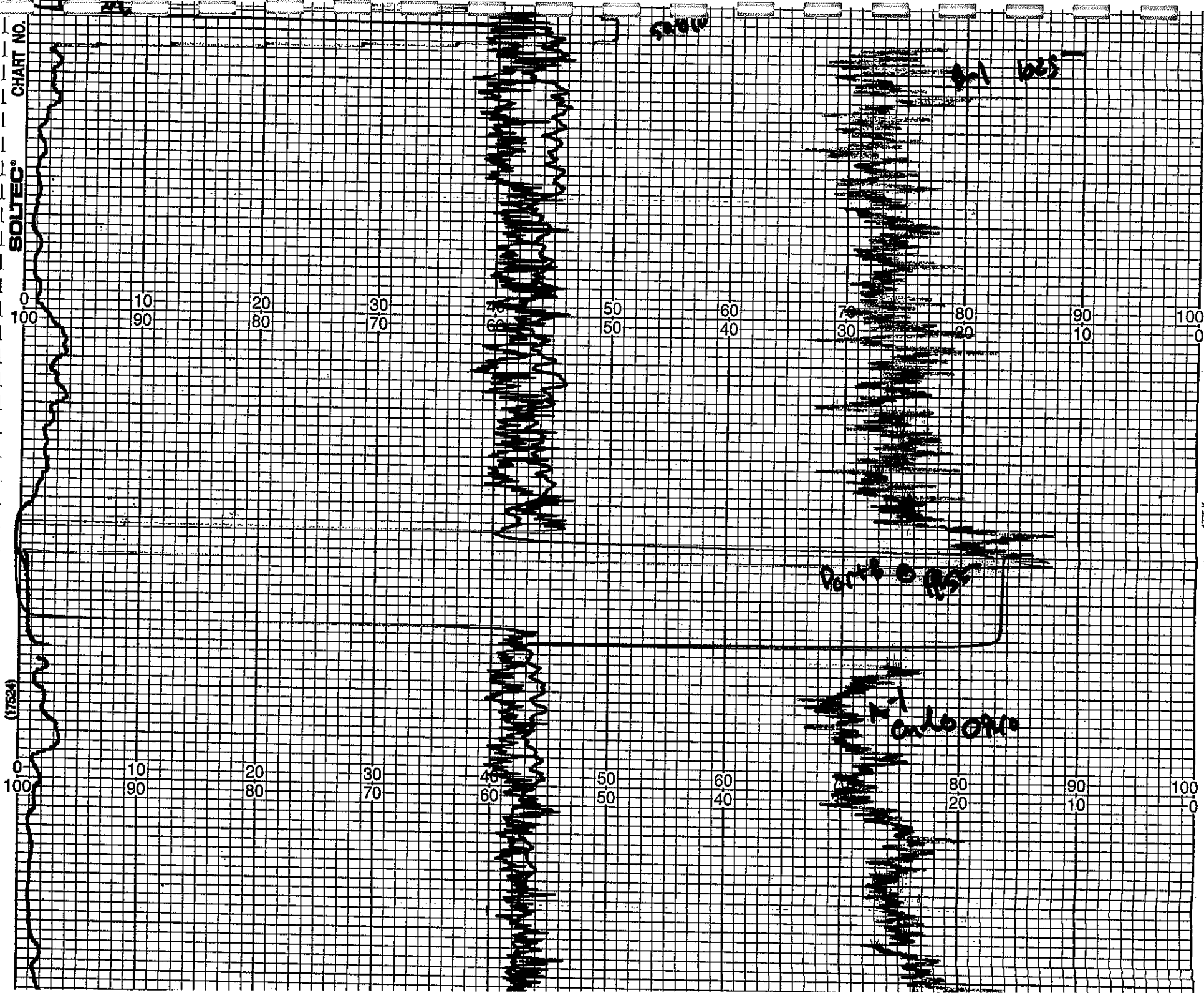
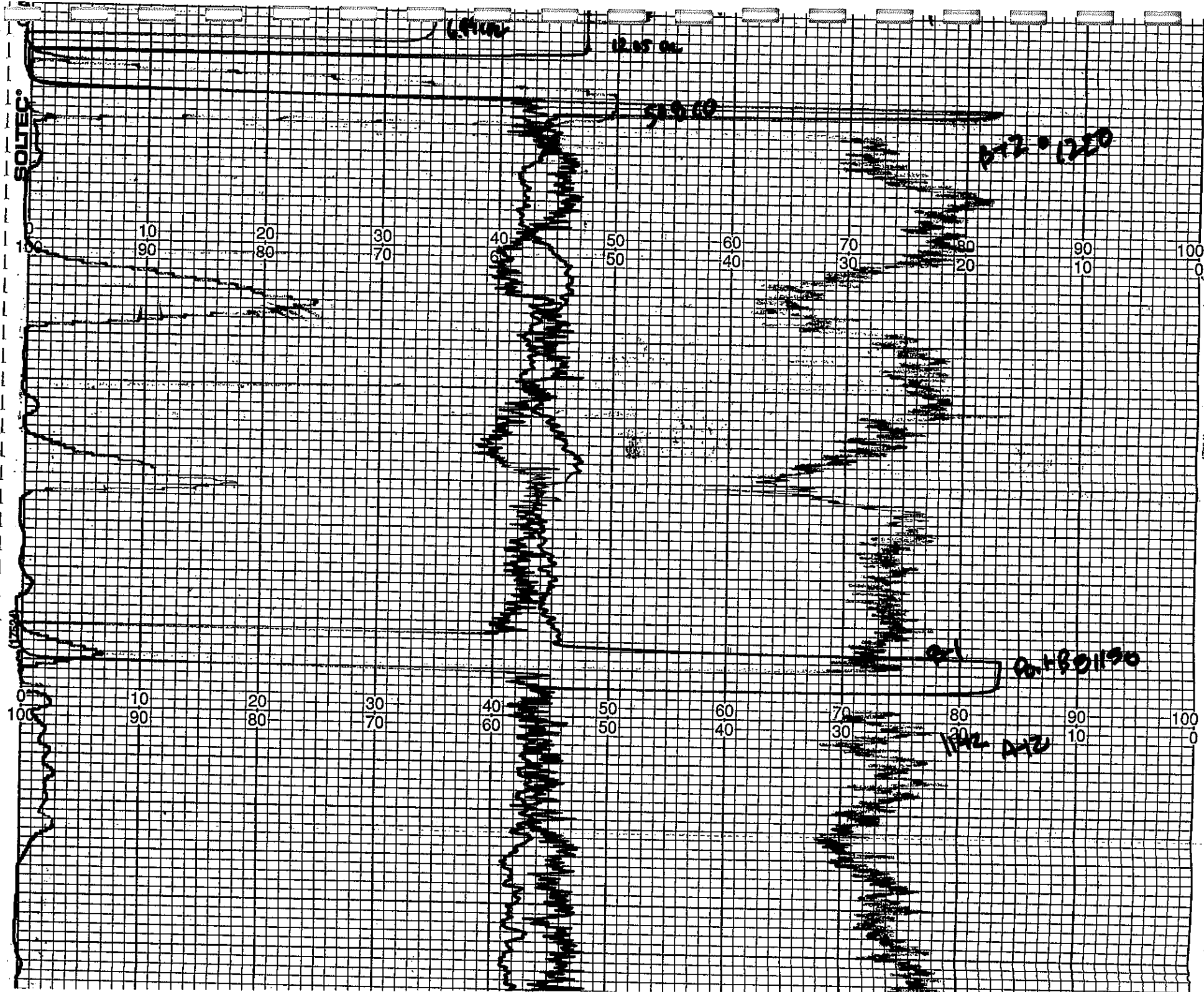


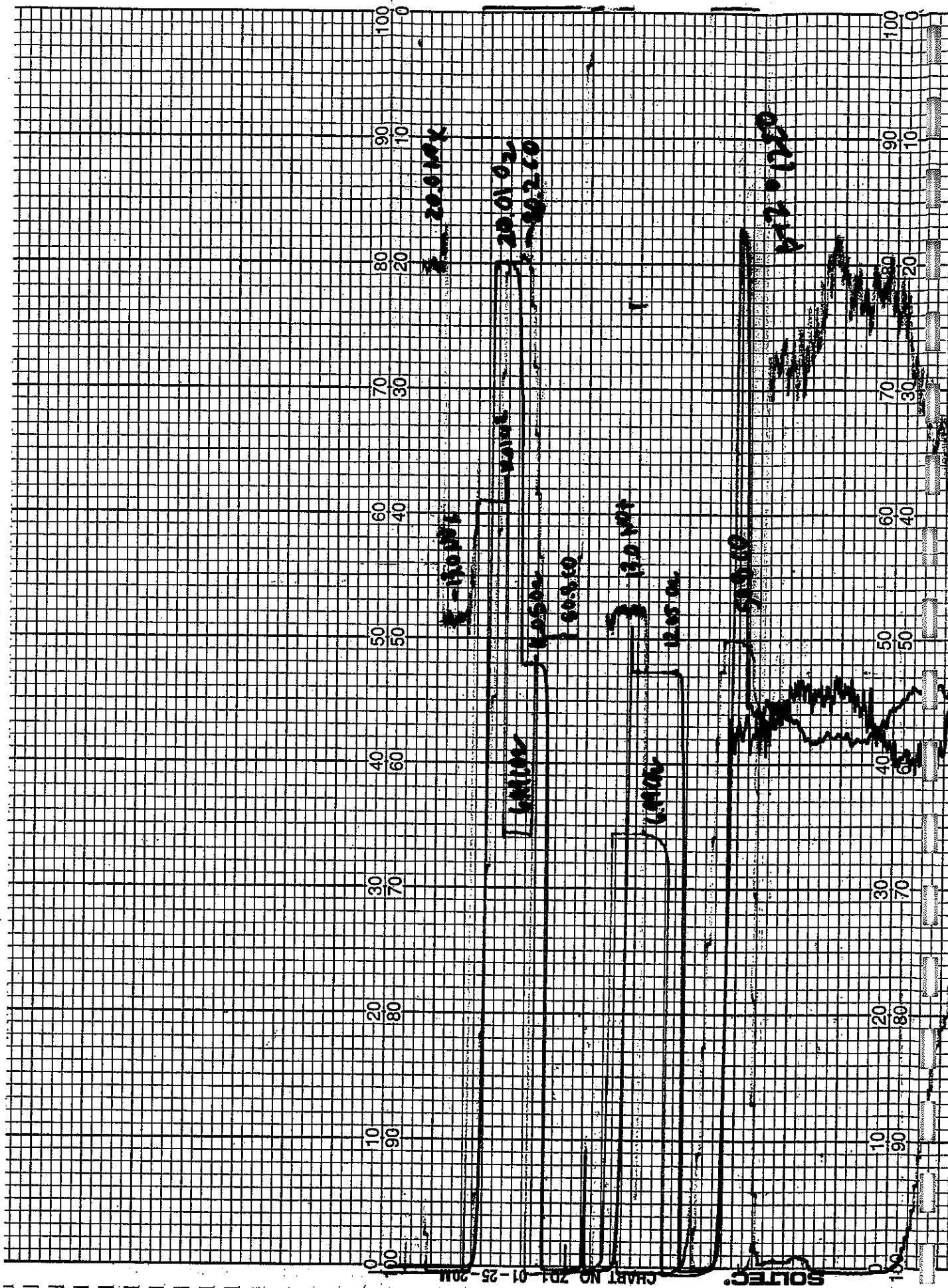
CHART NO. 201-01-25-20M

SOLTEC

079







APPENDIX G - Process Data

Phase #3

Row 1	sum	gpm	OP
0900	1907	3.3	1573
0920	1905	3.4	1575
0930	1900	3.5	1574
0940	1910	3.5	1575
0955	1955	3.7	1573
1005	1982	3.7	1586
1015	1975	3.6	1586
1025	1978	3.6	1585
Ave.	1940.3	3.5	1578.4
Row 2	1939	3.5	1578
1112	1982	3.6	1543
1122	1972	3.7	1554
1132	1978	3.7	1550
1142	1980	3.7	1551
1150	1977	3.7	1584
1200	1985	3.7	1594
1210	1975	3.7	1594
1220	1969	3.6	1587
Ave.	1977.3	3.639	1569.6
	1976	3.7	1570

APPENDIX H - Permit to Operate



PERMIT TO OPERATE

This initial permit must be renewed ANNUALLY unless the equipment is moved, or changes ownership.
If the billing for the annual renewal fee (Rule 301.f) is not received by the expiration date, contact the District.

Legal Owner
or Operator:

WASTE MGMT DISPOSAL&RECYCLING SERVS INC
9081 TUJUNGA AVE
SUN VALLEY, CA 91352

ID 50310

Equipment Location: 9227 TUJUNGA AVE, SUN VALLEY, CA 91352-1542

Equipment Description :

LANDFILL GAS FLARING SYSTEM NO. 3 CONSISTING OF:

1. INLET SEPARATOR
2. PARTICULATE SCRUBBER, LANDFILL GAS, JOHN ZINK, 2'-6" DIA. X 13'-7" H.
3. TWO BLOWERS, LANDFILL GAS, EACH 75 H.P.
4. FLARE NO. 3, 8'-0" DIA. X 50'-0" H, WITH A MULTIJET BURNER, A PROPANE GAS PILOT, ELECTRIC IGNITER, UV FLAME SENSOR, THERMOCOUPLE WITH TEMPERATURE INDICATOR AND RECORDER, AUTOMATIC SHUTDOWN AND ALARM SYSTEM, AUTOMATIC COMBUSTION AIR REGULATING SYSTEM, TEMPERATURE CONTROLLER, FLAME ARRESTOR AND FIVE CONDENSATE INJECTION GUNS.

Conditions :

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
3. THIS EQUIPMENT SHALL BE OPERATED AND MAINTAINED BY PERSONNEL PROPERLY TRAINED IN ITS OPERATION.
4. THE FLARE SHALL BE EQUIPPED WITH A TEMPERATURE INDICATOR AND RECORDER WHICH MEASURES AND RECORDS THE GAS TEMPERATURE (IN DEGREES F) IN THE FLARE STACK. THE TEMPERATURE INDICATOR AND RECORDER SHALL OPERATE WHENEVER THE FLARE IS IN OPERATION.

ORIGINAL



PERMIT TO OPERATE

CONTINUATION OF PERMIT TO OPERATE

5. WHENEVER THE FLARE IS IN OPERATION, EXCEPT DURING START-UP, A TEMPERATURE OF NOT LESS THAN 1400 DEGREES F, AS MEASURED BY THE TEMPERATURE INDICATOR AND RECORDER, SHALL BE MAINTAINED IN THE FLARE STACK. THE THERMOCOUPLE USED TO MEASURE THE TEMPERATURE SHALL BE ABOVE THE FLAME ZONE AND AT LEAST 3 FEET BELOW THE TOP OF THE FLARE SHROUD AND AT LEAST 0.6 SECONDS DOWNSTREAM OF THE BURNER.
6. A FLOW INDICATING AND RECORDING DEVICE SHALL BE MAINTAINED IN THE LANDFILL GAS SUPPLY LINE TO THE FLARE TO MEASURE AND RECORD THE QUANTITY OF LANDFILL GAS (IN SCFM) BEING BURNED.
7. THE HEAT RELEASE FROM THE LANDFILL GAS BURNED IN THE FLARE SHALL NOT EXCEED 62 MM BTU/HR.
8. THE BTU CONTENT OF THE LANDFILL GAS SHALL BE MEASURED USING AN INSTRUMENT APPROVED BY THE AQMD AND RECORDED DAILY.
9. WHENEVER THE CONDENSATE INJECTION STATION IS IN OPERATION, NOT MORE THAN 5 GALLONS PER MINUTE OF CONDENSATE SHALL BE INJECTED INTO THE FLARE.
10. A FLOW INDICATOR AND RECORDER SHALL BE INSTALLED AT EACH CONDENSATE INJECTION STATION AND SHALL OPERATE WHENEVER THE CONDENSATE INJECTION STATION IS IN OPERATION.
11. ALL RECORDING DEVICES SHALL BE SYNCHRONIZED WITH RESPECT TO THE TIME OF DAY.
12. THE FLARE SHALL BE EQUIPPED WITH A FLARE FAILURE ALARM WITH AN AUTOMATIC BLOWER SHUT-OFF SYSTEM.
13. THE FLARE FAILURE ALARM WITH THE AUTOMATIC BLOWER SHUT-OFF SYSTEM SHALL BE TESTED ANNUALLY FOR PROPER OPERATION AND RESULTS RECORDED.
14. A PRESSURE DIFFERENTIAL INDICATOR SHALL BE MAINTAINED ACROSS THE FLAME ARRESTOR.
15. A SUFFICIENT NUMBER OF SIGHT GLASS WINDOWS SHALL BE INSTALLED IN THE FLARE TO ALLOW VISUAL INSPECTION OF THE FLAME AND THERMOCOUPLE LOCATION WITHIN THE FLARE AT ALL TIMES. ADEQUATE AND SAFE ACCESS SHALL BE PROVIDED FOR ALL PORTS UPON REQUEST BY AQMD PERSONNEL.
16. A SET OF FOUR SAMPLING PORTS SHALL BE INSTALLED IN THE FLARE SHROUD AND LOCATED AT LEAST TWO FEET ABOVE THE FLAME ZONE AND AT LEAST THREE FEET BELOW THE TOP OF THE FLARE SHROUD. EACH PORT SHALL BE INSTALLED AT 90 DEGREES APART AND SHALL CONSIST OF FOUR INCH COUPLINGS. ADEQUATE AND SAFE ACCESS TO ALL TEST PORTS SHALL BE PROVIDED BY THE APPLICANT WITHIN 24 HOURS OF A REQUEST BY THE AQMD TO CONDUCT A TEST.

ORIGINAL



PERMIT TO OPERATE

CONTINUATION OF PERMIT TO OPERATE

17. A SAMPLING PORT, OR OTHER METHOD APPROVED BY THE AQMD, SHALL BE INSTALLED AT THE INLET GAS LINE TO THE FLARE.
18. THE SKIN TEMPERATURE OF THE FLARE SHROUD WITHIN FOUR FEET OF ALL THE SOURCE TEST PORTS SHALL NOT EXCEED 250 DEGREES F. IF A HEAT SHIELD IS REQUIRED TO MEET THIS REQUIREMENT, ITS DESIGN SHALL BE APPROVED BY THE AQMD PRIOR TO CONSTRUCTION. THE HEAT SHIELD, IF REQUIRED TO MEET THE TEMPERATURE REQUIREMENT, SHALL BE IN PLACE WHENEVER A SOURCE TEST IS CONDUCTED BY THE AQMD.
19. THE APPLICANT SHALL CONDUCT A SOURCE TEST ANNUALLY OR PER THE APPROVED 1150.1 COMPLIANCE PLAN. THE TEST SHALL BE PERFORMED IN ACCORDANCE WITH AQMD APPROVED TEST PROCEDURES. THE TEST SHALL INCLUDE, BUT MAY NOT BE LIMITED TO, A TEST OF THE FLARE FOR:
 - A. LANDFILL GAS COMPOSITION AND HEATING VALUE (INLET)
 - B. LANDFILL GAS FLOW RATE, SCFM (INLET)
 - C. TOTAL SULFUR COMPOUNDS AS H₂S, PPMV (INLET)
 - D. TEMPERATURE, F (EXHAUST)
 - E. FLOW RATE, DSCFM (EXHAUST)
 - F. NOX, LBS/HR AND LBS/MMBTU (EXHAUST)
 - G. SOX, LBS/HR (EXHAUST)
 - H. CO, LBS/HR (EXHAUST)
 - I. PM, LBS/HR AND GR/DSCF (EXHAUST)
 - J. TOTAL NON-METHANE ORGANICS, LBS/HR (INLET AND EXHAUST)
 - K. RULE 1150.1 TOXIC COMPOUNDS, PPMV (INLET AND EXHAUST)
20. EMISSIONS OF NOX FROM THE FLARE SHALL NOT EXCEED 0.06 LBS PER MILLION BTU.
21. EMISSIONS RESULTING FROM FLARE NO. 3 SHALL NOT EXCEED THE FOLLOWING:

ROG	0.66 LBS/HR
NOX	2.58 LBS/HR
SOX	3.16 LBS/HR
CO	2.37 LBS/HR
PM10	1.31 LBS/HR
22. ANY BREAKDOWN OR MALFUNCTION OF THE LANDFILL GAS FLARE RESULTING IN THE EMISSION OF RAW LANDFILL GAS SHALL BE REPORTED TO THE AQMD WITHIN ONE HOUR OF OCCURRENCE, AND IMMEDIATE REMEDIAL MEASURES SHALL BE UNDERTAKEN TO CORRECT THE PROBLEM AND PREVENT FURTHER EMISSIONS INTO THE ATMOSPHERE.
23. ALL RECORDS SHALL BE KEPT FOR A PERIOD OF AT LEAST TWO (2) YEARS AND SHALL BE MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST. A RECORD OF THE HOURS OF FLARE OPERATION SHALL BE INCLUDED.

ORIGINAL



SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 East Copley Drive, Diamond Bar, CA 91765

Page 4
Permit No.
F67268
A/N 425259

PERMIT TO OPERATE

CONTINUATION OF PERMIT TO OPERATE

24. FLARE START-UP TIME SHALL NOT EXCEED 30 MINUTES. ANY OUTAGE THAT RESULTS IN THE SHUTDOWN OF THE FLARE SHALL NOT BE CONSIDERED A BREAKDOWN PROVIDING NO EMISSION OF RAW LANDFILL GAS OCCURS.
25. MITIGATION MEASURES, OTHER THAN THOSE INDICATED IN THESE CONDITIONS, WHICH ARE DEEMED APPROPRIATE BY AQMD PERSONNEL AS NECESSARY TO PROTECT THE COMFORT, REPOSE, HEALTH OR SAFETY OF THE PUBLIC, SHALL BE IMPLEMENTED UPON REQUEST.

NOTICE

IN ACCORDANCE WITH RULE 206, THIS PERMIT TO OPERATE OR COPY SHALL BE POSTED ON OR WITHIN 8 METERS OF THE EQUIPMENT.

THIS PERMIT DOES NOT AUTHORIZE THE EMISSION OF AIR CONTAMINANTS IN EXCESS OF THOSE ALLOWED BY DIVISION 26 OF THE HEALTH AND SAFETY CODE OF THE STATE OF CALIFORNIA OR THE RULES OF THE AIR QUALITY MANAGEMENT DISTRICT. THIS PERMIT CANNOT BE CONSIDERED AS PERMISSION TO VIOLATE EXISTING LAWS, ORDINANCES, REGULATIONS OR STATUTES OF OTHER GOVERNMENT AGENCIES.

EXECUTIVE OFFICER

Dorris M. Bailey

By Dorris M. Bailey/TK01
3/18/2004

ORIGINAL

089

